Unclassified

Draft Supplemental Environmental Impact Statement for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet

Volume II

Appendices A-H

September 2013

Prepared by:

Department of the Navy

A December 2008 Notice of Record of Decision for the Introduction of 12 P-8A MMA Squadrons and One FRS into the U.S. Navy Fleet

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3810-FF

DEPARTMENT OF DEFENSE

Department of the Navy

Record of Decision for the Introduction of 12 P-8A Multi-Mission Maritime Aircraft (MMA) squadrons and one Fleet Replacement Squadron (FRS) into the U.S. Navy Fleet

AGENCY: Department of the Navy, DoD

ACTION: Notice of Record of Decision

SUMMARY: The Department of Navy (Navy), after carefully weighing the operational and environmental consequences of the proposed action, announces its decision to introduce 12 P-8A Multi-Mission Maritime Aircraft (MMA) squadrons and one Fleet Replacement Squadron (FRS) into the U.S. Navy Fleet.

FOR FURTHER INFORMATION CONTACT: Mr. Chris Harding, Environmental Planning Division, Department of the Navy

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SUPPLEMENTARY INFORMATION: Pursuant to Section 102(2) (c) of the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. Section 4321, et seq.; Council on Environmental Quality Regulations (40 CFR 1500-1508); and Department of the Navy regulations (32 CFR 775), the Navy announces its decision to provide facilities and functions to support homebasing 12 P-8A Multi-Mission Maritime Aircraft (MMA) squadrons and one Fleet Replacement Squadron (FRS) into the U.S. Navy Fleet. The P-8A MMA will replace the current maritime patrol aircraft, the P-3C Orion at existing maritime patrol homebases. The proposed action will be accomplished as set out in Alternative (ALT) 5, described in the Final Environmental Impact Statement (FEIS) as the preferred alternative. The implementation of this alternative will result in the homebasing of five fleet squadrons (30 aircraft) and one Fleet Replacement Squadrons (FRS) (12 aircraft) at Naval Air Station (NAS) Jacksonville, Florida; four fleet squadrons (24 aircraft) at NAS Whidbey Island, Washington; three fleet squadrons (18 aircraft) at Marine Corps Base Hawaii (MCBH) Kaneohe

Bay, Hawaii; and periodic squadron detachment operations (no permanent aircraft) at NAS North Island, California. Introduction of the MMA squadrons in the U.S. Navy Fleet is projected to begin no later than 2012 and be completed by 2019.

The Notice of Intent was published in the Federal Register (71FR77741) on December 27, 2006. Notification of public scoping was also made through local media outlets, as well as through letters to federal, state, and local agencies and officials, interested groups and organizations, and individuals. Four public scoping meetings were held between January 11, 2007 and February 15, 2007 in Jacksonville, Florida; Honolulu, Hawaii; Coronado, California; and Oak Harbor, Washington.

The Notice of Availability for the Draft Environmental Impact Statement (DEIS) was published in the Federal Register on March 7, 2008 (73FR12413). The Navy's Notice of Public Hearings was published in the Federal Register on March 7, 2008 (73FR12397). Public hearings were conducted in Oak Harbor, Washington; Kaneohe, Hawaii; Coronado, California; and Jacksonville, Florida between March 26, 2008 and April 9, 2008. A total of 18 individuals, agencies, and organizations submitted 25 comments on the DEIS.

The Notice of Availability of the FEIS was published in the Federal Register on November 21, 2008 (73FR70639). Notices in newspapers published in California, Florida, Hawaii, and Washington also announced the release and summarized the results of the FEIS. The FEIS addressed all oral and written comments received during the DEIS public and agency comment periods. The FEIS was mailed to all individuals, agencies, and organizations that requested a copy of the final document. The FEIS is publicly available on the website at http://www.mmaeis.com.

BACKGROUND: The P-8A MMA is being introduced to replace the aging P-3C Orion aircraft beginning no later than 2012. The P-8A MMA has been specifically designed to replace the P-3C, enabling it to become the next generation Navy maritime patrol aircraft. The Navy's proposed action is to provide facilities and functions to support homebasing the P-8A MMA at established maritime patrol homebases. The established maritime patrol homebases considered in the FEIS included NAS Jacksonville, Florida; NAS Whidbey Island, Washington; and Marine Corps Base Hawaii (MCBH)

Kaneohe Bay. In addition, maritime patrol aircraft are periodically detached to NAS North Island, California.

In the FEIS, the Navy evaluated the environmental consequences associated with proposed P-8A MMA operations, personnel transition, and new construction or renovation of structures to accommodate homebasing of the P-8A MMA as the Navy phases its current maritime patrol aircraft, the P-3C Orion, out of service.

ALTERNATIVES CONSIDERED: The Navy identified and evaluated a reasonable range of alternatives based on criteria set out in the FEIS that would satisfy its purpose and need. Alternatives considered in the FEIS were identified as ALT 1 through 6 and the no-action alternative. The alternatives assessed in the FEIS are described as follows:

ALT 1 proposed homebasing six fleet squadrons with a FRS at NAS Jacksonville, three fleet squadrons at NAS Whidbey Island, and three fleet squadrons at MCBH Kaneohe Bay, with periodic squadron detachment operations at NAS North Island.

ALT 2 proposed homebasing five fleet squadrons with a FRS at NAS Jacksonville, seven fleet squadrons at NAS Whidbey Island, a permanent squadron detachment at MCBH Kaneohe Bay, and periodic squadron detachment operations at NAS North Island.

ALT 3 proposed homebasing five fleet squadrons with a FRS at NAS Jacksonville, five fleet squadrons at NAS Whidbey Island, and two fleet squadrons at MCBH Kaneohe Bay, with periodic squadron detachment operations at NAS North Island.

ALT 4 proposed homebasing five fleet squadrons at NAS Jacksonville, five fleet squadrons with a FRS at NAS Whidbey Island, and two fleet squadrons at MCBH Kaneohe Bay, with periodic squadron detachment operations at NAS North Island.

ALT 5 proposed homebasing five fleet squadrons with a FRS at NAS Jacksonville, four fleet squadrons at NAS Whidbey Island, and three fleet squadrons at MCBH Kaneohe Bay, with periodic squadron detachment operations at NAS North Island.

ALT 6 proposed homebasing five fleet squadrons at NAS Jacksonville, four fleet squadrons with a FRS at NAS Whidbey Island, and three fleet squadrons at MCBH Kaneohe Bay, with periodic squadron detachment operations at NAS North Island.

The no action alternative would maintain the status quo at maritime patrol homebases. No new or expanded facilities would be constructed, and there would be no increase in functional capacity at any homebasing site. While the no action alternative does not meet the purpose and need of providing adequate facilities and functions to support the introduction of the P-8A MMA squadrons to the U.S. Navy Fleet, it served as a baseline for describing and quantifying the impacts associated with the various basing alternatives analyzed in the FEIS.

ALT 5 is identified in the FEIS as the preferred alternative since it best meets mission requirements while optimizing operational efficiencies related to training and contractor logistics support functions. In addition, ALT 5 is the environmentally preferable alternative. Although all alternatives will unavoidably impact wetlands at NAS Whidbey Island, ALT 5 will only affect 0.2 acres of wetlands. The implementation of mitigation measures will minimize wetland impacts. Furthermore, when compared against ALT 1, the other alternative that minimizes wetlands impacts at NAS Whidbey Island, implementation of ALT 5 will result in lower noise impacts at NAS Jacksonville. Many of the environmental impacts associated with homebasing the P-8A MMA squadrons will be common to all of the homebasing alternatives: lower personnel loadings, decrease in airfield operations, an increase in off-station noise exposure, and effects due to the construction of support facilities.

ENVIRONMENTAL IMPACTS: To avoid major interruptions in service and maintain combat readiness, the P-3C aircraft will be progressively retired as the P-8A MMA is introduced during a seven-year transition period from 2012 to 2019. Impacts resulting from implementation of the proposed action are quantified from the baseline year of 2011 (the year prior to the P-8A MMA introduction), to the year 2019 when the transition will be complete. Significant potential environmental impacts that may result from implementation of the preferred alternative include changes in airfield operations, noise and land use.

Since the replacement of the P-3C by the P-8A MMA will ultimately result in an overall decrease in the number of maritime patrol aircraft and associated personnel, airfield operations will decrease at all homebases. Even with the homebasing of five fleet squadrons and the FRS at NAS Jacksonville, the airfield operations will decrease by 21%, the greatest to occur at any of the homebasing sites under ALT 5. The least decrease in airfield operations (less than 1%) will occur at NAS Whidbey Island and NAS North Island. MCBH Kaneohe Bay will experience 10% fewer airfield operations with homebasing of the P-8A MMA when compared to the no-action alternative.

The P-3C, as a turboprop and the P-8A, as a jet aircraft, have different noise characteristics. Although noise levels for the P-3C and P-8A flight profiles are similar for takeoffs and landings, the P-8A MMA flight profiles for touch and go operations are noticeably louder than those for the P-3C. The projected noise contours for the 65 dB DNL contours increase compared with the baseline contours under all alternatives. However, the projected noise contours for the loudest noise exposure (greater than 75 dB DNL) remain almost entirely within the base boundaries under all alternatives. Consequently, despite the projected decreases in airfield operations, the number of persons exposed to aircraft noise at a Day-Night Level (DNL) greater than 65 decibels (dB) at NAS Jacksonville will increase by 685 people based on projected population growth factor applied to Duval County, Florida. This is because the 234 acres of land that will be located within the projected greater-than-65 dB DNL noise zones will include 41 acres of new residential land uses off-installation. An additional 605 people and approximately 8 acres of land would be located within the 65 dB DNL noise zone at NAS Whidbey Island. The increase in population is primarily due to the projected population growth of Oak Harbor and Island County, Washington. These noise impacts are unavoidable due to the P-8A MMA flight operations and training requirements. At MCBH Kaneohe Bay, because the noise contours are almost entirely over water, there will be no change in the number of persons and only a minor increase of approximately 1 acre within the greater-than-65 dB DNL noise zones. Both the population and land area within the greater-than-65 dB DNL noise zones will decrease at NAS North Island (47 people and approximately 3 acres, respectively).

There will be no additional incompatible land uses within noise zones at NAS Whidbey Island, MCBH Kaneohe Bay, or NAS North Island.

With implementation of ALT 5, there will be an increase in short-term, temporary construction-related air emissions at all homebasing sites. New construction will not be required to support detachments at NAS North Island, therefore, there will be no construction-related emissions at NAS North Island. With the exception of a minor increase in NOx emissions at NAS Whidbey Island, operation of the P-8A MMA will result in a long term reduction in air emissions for all criteria pollutants at each of the proposed homebases and NAS North Island.

Fewer military personnel per P-8A MMA squadron are needed than per P-3C squadron because fewer crew members are required per aircraft and fewer support personnel are needed to maintain and service each aircraft. Under ALT 5, these lower personnel loadings will result in a slight decrease in population in the municipalities surrounding NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay (0.7%, 1.2%, and 0.2%, respectively). Similarly, total school district enrollment will decrease at each homebasing site, with the greatest decrease occurring at MCBH Kaneohe Bay (6.8%) and the smallest decrease at NAS Jacksonville (less than 1%). However, the projected changes in local population will be gradual and phased over several years as the P-8A MMA is progressively introduced. This phasing will minimize any community impacts associated with transitioning personnel.

Lower personnel loadings will also affect regional annual earnings at each homebasing site under ALT 5. At NAS Jacksonville, regional annual earnings are projected to decrease by $285.9 million. Regional annual earnings will be less affected at NAS Whidbey Island and MCBH Kaneohe Bay (decreases of $28.8 million and $93.5 million, respectively). However, implementation of ALT 5 will result in the generation of between $167 and $520 million dollars in one-time construction expenditures, depending on facilities needs at each homebasing site. Existing socioeconomic conditions at NAS North Island would remain the same as under the no-action alternative given the transient nature of squadron detachments to that air station.

An analysis was conducted in compliance with Executive Order (E.O.) 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) and E.O. 13045 (Protection of Children from Environmental Health Risks and Safety Risks). This analysis found that due to aircraft noise impacts and using trend analysis of census data and projected population growth factors, implementation of ALT 5 may result in disproportionately high and adverse human health or environmental effects on minority populations and environmental health risks on children at one homebasing location (NAS Jacksonville). The projected greater than 65 DNL noise zone for NAS Jacksonville extends partially over two census tracts that contain a higher percentage of minority populations of Hispanic origin and children than the respective community of comparison. Based upon this census tract data, the EIS concluded that ALT 5 could result in disproportionately high and adverse effects on minority populations and children living near NAS Jacksonville. Low-income populations will not incur disproportionately high and adverse human health or environmental effects. At the NAS Whidbey Island, MCBH Kaneohe Bay, and NAS North Island homebasing locations, there will be no potential for disproportionately high and adverse human health or environmental effects on minority and low-income populations nor environmental health risks and safety risks for children.

Other potential impacts from implementing ALT 5 may result from changes in topography and soils, water resources, and wetlands as a result of construction activities. With the exception of NAS Whidbey Island, there will be no changes to topography, no significant filling or grading activities, or effects to wetlands at NAS Jacksonville, MCBH Kaneohe Bay, and NAS North Island. With implementation of Best Management Practices (BMPs) as specified in each air station's Storm Water Pollution Prevention Plan, there will be a negligible impact on water quality, and no impact on floodplains or groundwater. However, the NPDES stormwater permits at NAS Jacksonville and MCBH Kaneohe Bay will need to be revised.

At NAS Whidbey Island, the impacts of stormwater discharges to surface water bodies will be mitigated by the removal of up to 8.14 acres of existing impervious surface (unused runway pavements at the airfield) and implementation of BMPs as specified in the NAS Whidbey Island Stormwater Management Plan.

To provide an estimated 1 to 2 foot increase in surface elevation at NAS Whidbey, under ALT 5, there would be an unavoidable impact on about 0.2 acres of category III wetlands. To minimize wetland impacts, the Navy conducted a facility review and prepared a wetland mitigation plan. The 0.2-acre wetland loss will be mitigated by rehabilitation of degraded wetlands north of Crescent Harbor and within the NAS Whidbey Island installation boundary.

Under ALT 5, vegetation and wildlife will be affected by construction activities. At NAS Jacksonville, new construction will cause a permanent loss of vegetation, including approximately 4 acres of maintained lawn and potentially less than 1 acre of pine stand, but there will be no adverse impacts on wildlife. Construction activities at NAS Whidbey Island will result in the loss of 5.6 acres of herbaceous vegetation, most of which is maintained grass, and cause negligible impact on wildlife. A permanent loss of approximately 2 acres of Bermuda grass will occur at MCBH Kaneohe Bay due to construction, as well as other minor impacts on vegetation and negligible impacts on wildlife. There will be no impact on vegetation or wildlife at NAS North Island.

Based on the analysis contained in the FEIS, the Navy determined that implementation of ALT 5 may affect but is not likely to adversely affect marine threatened and endangered species at NAS Whidbey Island and MCBH Kaneohe Bay. Accordingly at NAS Whidbey Island, the Navy entered into informal consultation with the National Oceanic and Atmospheric Administration (NOAA) and National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (ESA). By letter dated 4 August, 2008, NMFS determined that the effects of the proposed action on ESA species within the marine environment near Ault Field, NAS Whidbey Island are expected to be insignificant and discountable and therefore concurred with the Navy's determination. NMFS did not require any further mitigation or conservation recommendations with respect to Steller sea lion, humpback whale, southern resident killer whale, marbled murrelet, leatherback sea turtle, Puget Sound chinook salmon, Puget Sound steelhead and bull trout.

At NAS Whidbey Island, the Navy determined that implementation of the proposed action may affect but is not likely to adversely affect the marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitat. On July 23, 2008 the Navy entered into informal consultation with the U.S. Fish and Wildlife Service (USFWS) under ESA Section 7. By letter dated October 5, 2008, USFWS concluded that the effects to the identified federally listed species would be insignificant or discountable and concurred with the Navy's determination. The USFWS did not require any further conservation recommendations.

At MCBH Kaneohe Bay, the Navy determined that implementation of Alt 5 may affect, but is not likely to adversely affect the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle. Pursuant to ESA Section 7, the Navy entered into informal consultation with NMFS on July 9, 2008 (supplemental information was provided to NMFS on September 24, 2008). By letter dated 25 July, 2008, and confirmed in correspondence on 1 October, 2008, NMFS concurred with the Navy's determination and did not require any further mitigation or conservation recommendations.

There will be no effect on threatened or endangered species at NAS Jacksonville or NAS North Island.

At NAS Whidbey Island the Navy determined that Essential Fish Habitat (EFH) as defined by the Magnuson-Stevens Fishery Conservation Act (MSA) may be adversely affected by implementation of ALT 5. In a letter dated August 4, 2008 NMFS determined that the conservation measures detailed in the FEIS as part of the proposed action are adequate to avoid, minimize, or otherwise offset potential adverse effects to the EFH of species, and determined conservation recommendations pursuant to MSA (section 305(b)(4)(A)) are not necessary.

In addition, the Navy determined that implementation of ALT 5 (including wetland mitigation) at NAS Whidbey Island will have no effect on archeological and historic resources. The Navy's determination is supported by archeological surveys that were conducted in and surrounding the project areas to identify any cultural resources that might be within the area of potential effect. The Phase 1 archaeological survey resulted in evidence of a historic logging operation, and remnants of maintenance structures associated with 20th century farming or dairy industry near construction area 3. The survey determined there is considerable potential that these sites have intact archaeological deposits. However, none of the proposed construction sites will impact any of the historic sites identified in the archeological survey. Once the final site designs for construction of the P-8A MMA facilities are completed, the Navy will submit these to the Washington State Historic Preservation Officer (SHPO), and will continue to consult to define the actual area of potential effect.

At MCBH Kaneohe Bay, the Navy determined that the proposed action will result in no adverse effect to historic properties or previously identified archeological sites. All proposed construction activities will occur in medium to low probability archeologically sensitive zones as identified by MCBH Kaneohe. A zone of medium archeological sensitivity is one where cultural resources are known to exist but the probability of encountering such resources is slight. Low sensitivity zones are areas where no cultural resources have been found and there is almost no probability of encountering cultural resources. Prior to the beginning of construction, the Navy will complete an archeological inventory survey of the final construction sites to verify and document the presence or absence of archeological resources. The result of this pre-construction archeological inventory survey will be used to mitigate any potential effects the proposed undertaking may have on archeological resources. Mitigation measures will include attempts to modify the construction footprint to avoid impacting these sites. An archeological work plan detailing monitoring and subsurface testing will be submitted to the Hawaii SHPO for review. In a letter dated October 20, 2008 and pursuant to Section 106 of the National Historic Preservation Act, the Hawaii SHPO has concurred that the implementation of ALT 5 will not affect historic properties at MCBH Kaneohe Bay.

The Florida SHPO has concurred that there will be no effect on either archeological or historic architectural resources at NAS Jacksonville.

No additional hazardous materials, and/or waste streams will be generated at any of the proposed homebasing sites that cannot be managed by existing functions and facilities.

MITIGATION MEASURES: The Navy has committed to submit a site-specific Storm Water Pollution Prevention Plan (SWPPP) for NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay for new discharges that would include a site plan for managing storm water runoff and describe the BMPs to be implemented to minimize erosion, sedimentation, and storm water pollution. These may include grass swales to filter and reduce storm water runoff, silt fencing to minimize erosion, and berms to prevent silted runoff from entering storm drains.

Under ALT 5 the Navy has committed to implementing stormwater and wetlands mitigation at NAS Whidbey Island. At NAS Whidbey Island, increased stormwater runoff resulting from the development of new impervious surfaces will be mitigated by the removal of approximately 8.14 acres of a former runway located within the airfield. In addition, ALT 5 will offset the loss of approximately 0.2 acres of Category III wetlands at NAS Whidbey Island by rehabilitating wetlands at a mitigation site located north of Crescent Harbor on Whidbey Island. Under the provisions of the Clean Water Act, the Navy will be required to apply for permits pursuant to sections 401 and 404. Pending completion of final site design and permitting, appropriate wetland mitigation ratios will be determined through discussions with the Washington Department of Ecology and U.S. Army Corps of Engineers.

At MCBH Kaneohe Bay the proposed action will create and additional impervious surface of approximately 4.1 acres resulting in and additional stormwater runoff of approximately 4.67 million gallons per year. Implementation of the BMPs mentioned above will avoid impacts to Kaneohe Bay and other surface waters surrounding the base to the greatest extent possible. As part of MCBH Kaneohe Bay's SWPPP regular water sampling will be conducted to ensure that storm water discharges meet state water quality standards. No further stormwater mitigation at MCBH Kaneohe Bay is required.

No additional storm water mitigation at NAS Jacksonville is required.

No mitigation for ESA-listed species was required at any homebasing site.

Homebasing the P-8A MMA at NAS Whidbey Island is expected to have no effect on archeological and historic resources. However, once the final site designs for construction of the P-8A MMA facilities are completed, the Navy will submit these to the Washington State Historic Preservation Officer (SHPO), and will continue to consult to define the actual area of potential effect.

The Navy determined that the proposed action will result in no adverse effect to historic properties at MCBH Kaneohe Bay and that the proposed P-8A MMA construction will not impact previously identified archeological sites. Prior to the beginning of construction, the Navy will complete an archeological inventory survey of the final construction sites to verify and document the presence or absence of archeological resources. The result of this pre-construction archeological inventory survey will be used to mitigate any potential effects the proposed undertaking may have on archeological resources. Mitigation measures will include attempts to modify the construction footprint to avoid impacting these sites. An archeological work plan detailing monitoring and subsurface testing will be submitted to the Hawaii SHPO for review.

The Navy will continue community outreach to ensure effective communications with regard to noise impacts and recommended compatible land uses. Once MMA flight operations have commenced, the Navy will re-evaluate the noise study and land use analysis based on actual flight parameters in vicinity of homebases.

RESPONSE TO COMMENTS RECEIVED REGARDING THE FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS): The Navy has received no new or substantive comments on the FEIS.

CONCLUSIONS: In determining how and where to introduce the P-8A MMA aircraft as a replacement for the P-3C maritime patrol aircraft, the following factors were considered: operational and readiness requirements; costs associated with the construction, operation, and maintenance of aircraft and facilities; manpower requirements and costs; the analysis of environmental and socioeconomic effects within the FEIS; relevant federal and state statutes and regulations; and the comments received during the EIS process. After carefully weighing all of these factors, and analyzing the data presented in the FEIS, I have determined that the preferred alternative (ALT 5) best meets the needs of the Navy while minimizing potential environmental impacts. The preferred alternative maximizes the use of existing infrastructure at NAS Whidbey Island, NAS Jacksonville, and MCBH Kaneohe Bay; achieves economies of scale in support, maintenance, training, and personnel requirements; and maintains a maritime patrol capability that can sustain national defense objectives and policies during the transition from the P-3C to the P-8A MMA, and reduces or minimizes environmental impacts at all affected locations. It provides the best solution for the Navy, the affected communities, and the taxpayer.

12/23/2008.

Date

BJ Penn

Assistant Secretary

of the Navy

(Installations and Environment)

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B P-8A Flight Training

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P-8A Flight Training

The proposed action evaluated in this Supplemental Environmental Impact Statement (SEIS) is to provide facilities and functions to dual-site the P-8A Multi-Mission Maritime Aircraft at two established maritime patrol home bases. This document supplements the *Final Environmental Impact Statement (FEIS) for Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet*, completed in November 2008 (hereinafter referred to as the 2008 FEIS) (Navy 2008). Dual-site home basing would provide cost savings while reducing redundancies and still meeting current strategic operational objectives.

The environmental analysis in this SEIS is focused on personnel transition, new construction or renovation of structures, and airfield operations necessary to accommodate the basing of the P-8A as the Navy phases its current maritime patrol aircraft, the P-3C Orion, out of service. The Navy proposes to conduct the P-8A training operations in the same manner as it currently conducts the P-3C training operations. These training operations can be categorized into two primary operations:

- Graduate-level pilot training conducted at the P-8A squadron's home base, and
- Crew training conducted at military training ranges and operating areas (OPAREAs).

Graduate-Level Pilot Training.

The purpose of the pilot training program is to train and qualify an aviator for designation as Aircraft Commander, to ensure safe and efficient use of aircraft weapons system in all phases of operation and to be a tactically competent member of the crew. These pilots are already fully qualified naval aviators and are gaining advanced qualifications and refresher training. Typical events during a dedicated pilot training flight would be practice landings during day and night time, simulated emergency procedures, instrument-only approaches to the airfield, evaluations of technique, and training to become a pilot instructor. Environmental and safety impacts related to pilot training at and around the airfield are analyzed as part of the P-8A air operations in this EIS.

Crew Training.

The goal of crew training, which consists of formal training and a series of focused in-flight events, is to develop, refresh, and elevate aircrew and squadron proficiency in current tactics while validating squadron-level tactical standard operations procedures. The overall objective of the crew training program is to provide advanced, unit-level, tactical training that, when complemented by aircrew training in the weapons systems trainer, will enable a squadron to carry out mission-essential tasking assigned in the context of maritime patrol and reconnaissance operations. The crew conducts training with all tactical crewmembers present. The depth of training will address all tactical primary mission areas, permit individuals to gain tactical experience, and refine crew coordination skills. Successful completion will result in the crew gaining qualifications. An example of events are anti-submarine warfare in coordination with a submarine unit, coordinated anti-submarine warfare with a submarine and other ships and aircraft, anti-surface warfare with ships and aircraft, and several other warfare areas.

The aircraft operations at and around the airfield associated with crew training (departing the airfield to transit to the training range and returning from the training range) are analyzed in this SEIS. The Navy would use its existing ranges (the same ranges currently used for tactical training of P-3C aircrews) to conduct P-8A crew tactical training operations. Additionally, projected P-8A tactical training operations would be the same as existing P-3C training operations, and the P-8A would employ the same weapons systems and sonobuoys as currently used by the P-3C.

Tactical Training Theater Assessment and Planning Program.

Potential environmental impacts associated with these training activities in existing military training ranges and OPAREAs are being analyzed separately as part of the Navy's Tactical Training Theater Assessment and Planning (TAP) program. The Navy TAP Program provides future planning and management for its range complexes. The objectives of the program are to ensure the readiness of Navy personnel by preserving combat-like conditions in which to train and to promote sustainability of Navy ranges and OPAREAs, including natural and cultural resources. Under the current phase of the TAP program, the Navy is preparing National Environmental Policy Act (NEPA) documentation and Executive Order 12114 to assess the potential environmental effects associated with military readiness training and research, development, testing, and evaluation activities in the Navy's training ranges. Information can be found in the following documents:

NAS Jacksonville
Atlantic Fleet Training and Testing EIS/OEIS
http://aftteis.com/

NAS Whidbey Island
Northwest Training and Testing EIS/OEIS
https://nwtteis.com/

MCB Hawaii Kaneohe Bay and NB Coronado
Hawaii-Southern California Training and Testing EIS/OEIS
http://hstteis.com/

Under the previous phase of the TAP program, the Navy evaluated environmental effects associated with military readiness training and research, development, testing, and evaluation activities in the Navy's training ranges in the following documents. See Chapter 1.3.4.2 for information on current TAP efforts. Copies of these final documents can be found on the P-8A project website (www.mmaseis.com):

Jacksonville Range Complex EIS

Northwest Training Range Complex EIS

Southern California Training Range Complex EIS

Hawaii Training Range Complex EIS

Gulf of Mexico Range Complex EIS

Cherry Point Range Complex EIS

Virginia Capes Range Complex EIS

Atlantic Fleet Active Sonar Training EIS

C Agency Correspondence

March 12, 2013, letter from M. K. Nortier, Commanding Officer, NAS Whidbey Island, to Ms. Martha Jensen, USFWS, Lacy, Washington.

May 13, 2013, letter from Ken S. Berg, Manager, Washington Fish and Wildlife Service, to Captain Michael Nortier, Commanding Officer, U.S. Navy, Naval Air Station Whidbey Island.

July 17, 2013, letter from M. K. Nortier, Captain, NAS Whidbey Island, to The Honorable Thomas Wooten, Tribal Chair, Samish Indian Nation, Anacortes, Washington.

July 17, 2013, letter from M. K. Nortier, Captain, NAS Whidbey Island, to The Honorable Shawn Yanity, Tribal Chair, Stillaguamish Tribe of Indians of Washington, Arlington, Washington.

July 17, 2013, letter from M. K. Nortier, Captain, NAS Whidbey Island, to The Honorable Brian Cladoosby, Tribal Chair, Swinomish Indians of the Swinomish Reservation of Washington, La Conner, Washington.

July 17, 2013, letter from M. K. Nortier, Captain, NAS Whidbey Island, to The Honorable Jennifer Washington, Tribal Chair, Upper Skagit Indian Tribe, Sedro Woolley, Washington.

August 6, 2013, letter from D. R. George, Captain. U.S. Marine Corps, Director, Environmental Compliance and Protection Department, MCB Hawaii, Kaneohe Bay, to Mr. William Aila, State Historic Preservation Officer, Kapolei, Hawaii.

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DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
3730 NORTH CHARLES PORTER AVENUE
OAK HARBOR, WASHINGTON 98278-5000

IN REPLY REFER TO:
5090
Ser N44/0308
March 12, 2013

Ms. Martha Jensen
U.S. Fish and Wildlife Service
510 Desmond Drive SE
Lacy, WA 98503-1263

Dear Ms. Jensen:

SUBJECT: INFORMATIONAL UPDATE ON THE ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR NAVAL AIR STATION WHIDBEY ISLAND P-8A MULTI-MISSION AIRCRAFT INTRODUCTION (HUC 1711001903)

Thank you for meeting with staff from the Department of the Navy (DON) on November 15, 2012 to discuss the introduction of P-8A Multi-Mission Maritime Aircraft (MMA) to the U.S. Navy Fleet and changes this proposed action may have at Naval Air Station (NAS) Whidbey Island. Based on our discussions at this meeting, the DON presents the following updated information outlining the changes to the proposed action and determines there is no change to the effects determination of file number 13410-20008-I-0480.

As part of the analysis for the 2008 Final Environmental Impact Statement (FEIS) for "*Introduction of the P-8A Multi-Mission Maritime Aircraft (MMA) into the U.S. Navy Fleet*", six basing alternatives were considered. Alternative 5 was considered to best meet the mission requirements of the DON while optimizing operational efficiencies related to training and contractor logistics support functions. The DON concluded the effects of the proposed action "may affect, not likely adversely affect" the marbled murrelet (*Brachyramphus marmoratus*) and bull trout (*Salvelinus confluentus*). The DON received a letter from the U.S. Fish and Wildlife Service (USFWS) on September 15, 2008, concurring with the DON's determination. In 2008, after carefully weighing the operational and environmental consequences of the proposed action, the Navy issued a Record of Decision (ROD), implementing Alternative 5.

Under Alternative 5, the 2008 ROD authorized four P-8A squadrons to be home based at NAS Whidbey Island. At the time of the 2008 ROD, it was anticipated that the three existing P-3C squadrons at NAS Whidbey Island would begin transitioning to P-8A aircraft in the 2016-2017 timeframe.

The DON is now preparing a Supplemental Environmental Impact Statement (SEIS) to evaluate changes to the basing alternatives and analysis contained in the 2008 FEIS. The intent of the SEIS is to assess the potential environmental effects of homebasing P-8A aircraft at two locations (NAS Whidbey Island and NAS Jacksonville, Florida) and the related changes in aircraft operations and personnel, facility modifications and construction requirements. The SEIS analysis focuses on new basing alternatives, circumstances and information relevant to environmental concerns that have occurred since the 2008 ROD and will include updated information made available since the 2008 ROD.

The alternatives in the SEIS will consider three siting alternatives in addition to the No-Action Alternative, which is the 2008 ROD. All action alternatives involve a change in facilities and construction footprints, aircraft loading and air operations (see enclosure 1). Table 1 summarizes the breakdown of changes to P-8A aircraft loading by alternative.

Table 1 P-8A Aircraft Loading at NAS Whidbey Island

	Current Conditions	No Action Alternative (2008 ROD) (End State 2019)	ALT 2 (End State 2020)	ALT 5 (End State 2020)	ALT 7 (End State 2020)
	P-3C	P-8A			
Fleet Squadrons	3	4	7 (+3)	4 (0)	6 (+2)
Primary aircraft authorized per squadron	9	6	7 (+1)	7 (+1)	7 (+1)
Total fleet aircraft assigned	27	24	49 (+25)	28 (+4)	42 (+18)
Total	27	24	49 (+25)	28 (+4)	42 (+18)

Note: Numbers presented in parentheses represent a change

Since 2008, ongoing data analysis and evolving training requirements based on simulator fidelity have resulted in a considerable decrease in the number of air operations expected. Additionally, the flight profiles are better understood with the completion of flight test programs. Today, it is expected that a trained fleet pilot would utilize a simulator for approximately 70% of their training with the remaining 30% of their training spent in the air.

As such, it is estimated that the total number of airfield operations at NAS Whidbey Island at end-state year 2020, under all sitting alternatives, would be between 20 to 25% less depending on the alternative chosen, and that P-8A operations would be between 56 to 74% less than what was estimated in the 2008 ROD under the Preferred Alternative (see Table 2). It is estimated that P-8As will fly between 15,014 and 19,773 fewer annual operations than were estimated in the analysis supporting the 2008 ROD.

The increase in air operations at NAS Whidbey Island associated with the retention of three Expeditionary Electronic Attack (EA-18G) squadrons and a reserve squadron was not considered in the 2008 FEIS, but was consulted separately with USFWS under a separate National Environment Policy Act (NEPA) action. The disestablishment of Fleet Air Reconnaissance Squadron One (VQ-1) was not known at the time of the 2008 FEIS.

Table 2 Projected Airfield Operations at NAS Whidbey Island

	No Action Alternative (2008 ROD) (End State 2019)	ALT 2 (End State 2020)	ALT 5 (End State 2020)	ALT 7 (End State 2020)
EA-18G	40,521	47,778	47,778	47,778
EP-3 (VQ)	10,827	516	516	516
C-9B	650	874	874	874
C-40	-	2277	2277	2277
Transient	-	-	-	-
P-8A	26,632	11,618	6,859	10,290
P-8A Change from Baseline		(15,014 [56%])	(19,773 [74%])	(16,342 [61%])
Total Airfield	**78,630**	**63,063**	**58,304**	**61,735**
Change from Baseline		**(15,567)**	**(20,326)**	**(16,895)**
% Change from Baseline		**(20%)**	**(25%)**	**(21%)**

The introduction of the P-8A at NAS Whidbey Island would require facility renovation and construction that was not analyzed in the Draft Environmental Impact Statement (DEIS) or FEIS. Construction would include demolition of existing buildings and construction of new facilities, or renovation of existing facilities, as well as construction of aircraft parking ramp and taxiway connectors. Specifically, the maximum construction footprint would disturb approximately 21.86 acres and include:

a. Demolition of existing Building 126 (P-3C simulator facility) and construction of a new two-story P-8A trainer facility (101,104 square feet [sq ft]).

b. An approximately 660,000 sq ft expansion of the existing aircraft parking ramp and paving of additional area for aircraft parking.

c. Construction of a new P-8A hangar bay (83,087 sq ft).

d. Renovation of existing building 2771 for the Tactical Operations Center.

e. Construction of a Mobile Tactical Operations Center adjacent to building 2771 (28,894 sq ft).

f. Expansions of Hangar 6 and hangar bay modification (20,059 sq ft).

g. Construction of a Sensitive Compartmented Information Facility adjacent to Hangar 7 (5,000 sq ft).

h. Reuse of existing building 2738 adjacent to new trainer facility.

i. Construction of a Ground Support Equipment Shop (3,500 sq ft) and Outdoor Storage Area (12,000 sq ft).

j. Reuse of building 219.

The proposed construction areas are shown in enclosure 1. Construction of new facilities would result in the addition of approximately 0.24 acre of impervious surface at the station under Alternative 5; 9.16 acres under Alternative 7 and 15.76 acres under Alternative 2.

According to the USFWS, three listed species occur in Island County and may occur on or around NAS Whidbey Island: Golden paintbrush (*Castilleja levisecta* [threatened]), Coastal/Puget Sound distinct population segment (DPS) of bull trout (*Salvelinus confluentus* [threatened]) and marbled murrelet (*Brachyramphus marmoratus* [threatened]) (USFWS 2012). Proposed species for listing under Endangered Species Act (ESA) include Taylor's checkerspot butterfly (*Euphydryas editha taylori*) and the Streaked horned lark (*Eremophila alpestris strigata*) (77 FR 61937-62058).

Golden Paintbrush: No populations or individual occurrences of the golden paintbrush have been identified on Ault Field. Furthermore, no suitable habitat to support the species occurs within the proposed construction area. Consequently, the DON has determined that the proposed action would have "no effect" on the federally threatened golden paintbrush.

Bull Trout: There would be no in-water work as part of the proposed action. Consequently, there would be no direct effects to bull trout or its critical habitat. Most of the streams on Whidbey

Island are short coastal tributaries that flow intermittently. The proposed construction would not impact any of these streams, but would impact up to approximately 0.5 acre of palustrine emergent wetlands. This wetland impact is greater than what was identified in the 2008 ROD; approximately 0.2 acre would be impacted under the 2008 ROD.

Any additional stormwater generated from Ault Field from construction of new impervious surfaces would be mitigated for by the removal of impervious surface in other parts of the airfield; installing underground stormwater retention infrastructure; infiltrating storm water via wet ponds, ditches, and swales; or a combination of these measures. Stormwater would continue to be directed through approximately 20 miles of drainage ditches towards Clover Valley stream, which drains into Skagit Bay on the northeastern side of the island. Stormwater mitigation measures would likely result in a net zero change in the amount of runoff that is pumped from Dugualla Heights lagoon into the marine environment. Therefore, it is extremely unlikely that bull trout would be exposed to chemical levels that could be harmful to this species or its prey.

The change in P-8A aircraft operations would not result in measurable change in underwater sound levels. Thus, indirect effects to bull trout or its prey from the P-8A are considered discountable. Based on the above analysis, the DON has determined that the proposed action "may effect, not likely adversely affect" bull trout.

Marbled Murrelet: No suitable marbled murrelet breeding habitat is within 0.25 mile of the project area. Consequently, the species would not be affected by any construction activity proposed at the station.

Marbled murrelets forage in the marine waters around Whidbey Island and would therefore be exposed to P-8A aircraft operations. The marbled murrelet would not be affected by aircraft noise because noise levels would not increase compared to the No Action Alternative baseline under any of the alternatives. The P-8A aircraft would continue to operate in the same airfield environment as considered in the 2008 ROD. With annual aircraft operations at Ault Field reduced by up to 25% compared to the No Action Alternative baseline, there would be an expected slight reduction in the already infrequent and brief intersection of marbled murrelet flight within the P-8A airspace.

Based on these considerations, the DON has determined that the proposed action "may affect, not likely adversely affect" marbled murrelet.

Taylor's Checkerspot Butterfly: Once widely distributed throughout inland and costal grasslands in the Willamette Valley, Puget Sound and south Vancouver Island, this species has significantly declined due to loss of suitable habitat (Stinson 2005). Habitat requirements for the Taylor's Checkerspot consist of open grasslands and oak woodland or savannah sites where food plants for larvae and nectar sources for adults are available.

In Washington, approximately 45% of the subspecies occur on south Puget Sound prairies and the north Olympic Peninsula. According to 77 FR 61937-62058, their present range in Washington includes Clallam, Pierce and Thurston counties.

No populations have been identified on Whidbey Island. Furthermore, suitable grasslands/prairies identified at NAS Whidbey Island include those at the Seaplane Base and Navy Outlying Field (NOLF) Coupeville (NAS Whidbey Island 2012). There is no suitable checkerspot butterfly habitat within 0.25 mile of the project area. Therefore, the proposed action would have no effect on this species.

Streaked Horned Lark: The streaked horned lark is endemic to the Pacific Northwest, and is a subspecies of the wide-ranging horned lark. Historically, the streaked horned lark's breeding range extended from southern British Columbia, Canada, south through the Puget lowlands and outer coast of Washington, then down through southwestern Oregon.

Horned larks are birds of wide open spaces with no trees and few or no shrubs. They nest on the ground in sparsely vegetated sites such as prairies and open grassland habitats dominated by grasses and forbs (Stinson 2005). Streaked horned lark breeding in Washington is now limited to only 13 known sites, 6 of which are in the south Puget Sound area, while 4 are along the outer coast and 3 on islands in the lower Columbia River (Stinson 2005). Their reasons for decline are due to range contraction.

Similar to the Taylor's Checkerspot butterfly, no streaked horned lark populations have been identified on Whidbey Island. Furthermore, the only suitable grasslands/prairies identified at NAS Whidbey Island are those at the Seaplane Base and NOLF Coupeville (NAS Whidbey Island 2012). There is no suitable streaked horned lark habitat within 0.25 mile of the project area. Therefore, the proposed action would have no effect on this species.

The DON would appreciate an expedited review process in order to include the USFWS response into the Draft SEIS which will be made available to the public in summer 2013.

5090
Ser N44/0308
March 12, 2013

If you have any question regarding the project or the findings presented in this letter, please contact Mr. Michael Bianchi at (360) 257-4024 or michael.bianchi1@navy.mil.

Sincerely,

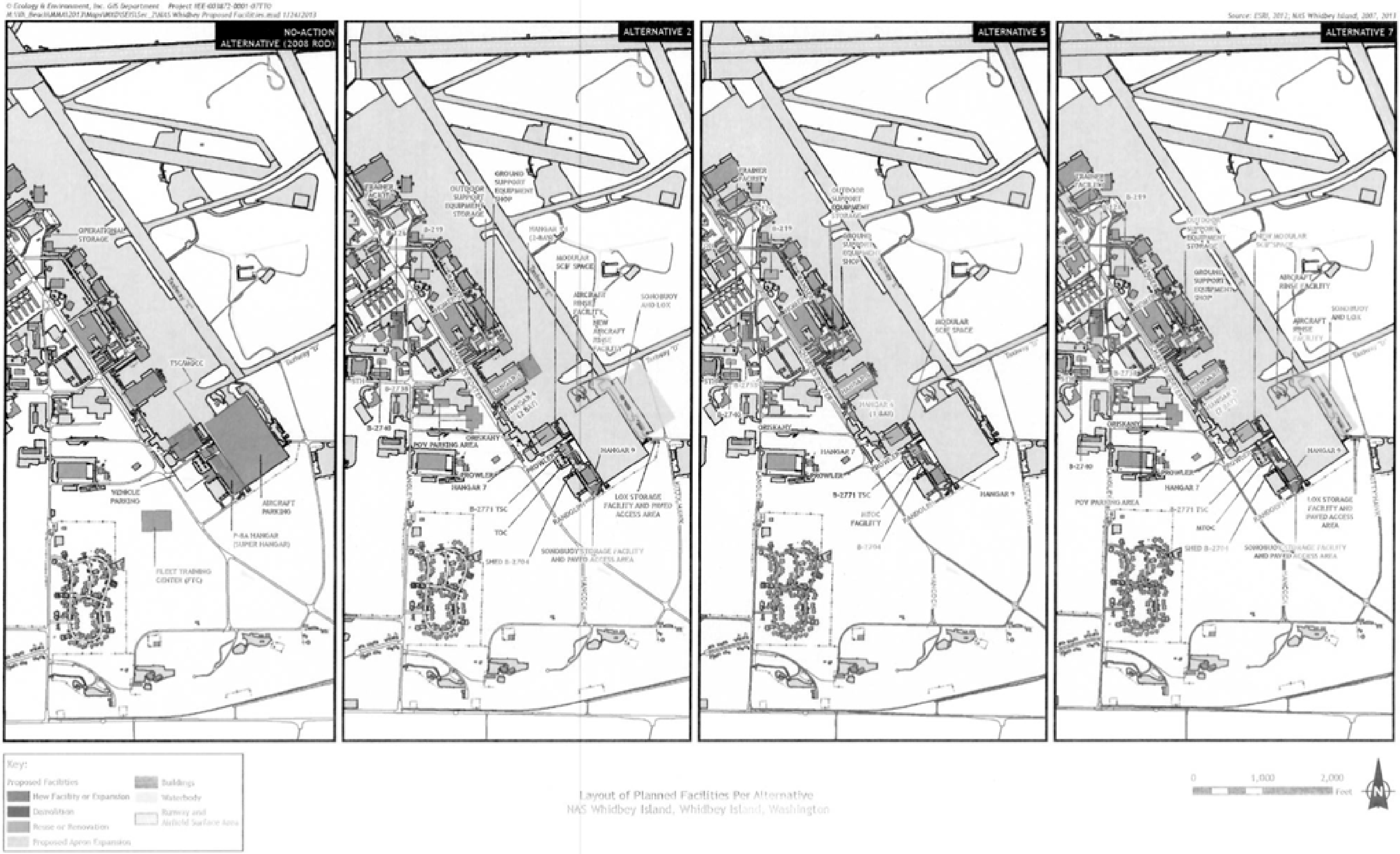
MKNt

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Layout of Planned Facilities Per Alternative

Copy to:
Cory Zahm, NAVFAC Atlantic (EV2)
George Hart, Navy Region Northwest (N40)
Michael Bianchi, NAS Whidbey Island (N44)

Greg Netti
Ecology and Environment, Inc.
368 Pleasant View Dr.
Lancaster, NY 14086



Layout of Planned Facilities Per Alternative
NAS Whidbey Island, Whidbey Island, Washington

Enclosure(1)

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

MAY 13 2013

In Reply Refer To:
13410-2008-I-0480-R001

Captain Michael Nortier
Commanding Officer
U.S. Navy, Naval Air Station Whidbey Island
3730 North Charles Porter Avenue
Oak Harbor, Washington 65078-5000

Dear Captain Nortier:

This is in response to your letter dated March 12, 2013 (5090, Ser N44/0308), requesting reinitiation of the consultation on the Naval Air Station (NAS) Whidbey Island P-8A Multi-Mission Aircraft Introduction Project (P-8A Project). Your letter was received in our office on March 29, 2013. Additional information was requested by the U.S. Fish and Wildlife Service (Service) on Friday, April 26, 2013, regarding the potential impacts of the project on the threatened golden paintbrush (*Castilleja levisecta*), and April 30, 2013, regarding Department of Navy (Navy) consultation on listed species in Florida. We received the requested information on April 29 and 30, 2013, respectively, via email from Michael Bianchi of your office. This informal consultation has been conducted in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Your March 12, 2013, letter requested our concurrence that the proposed changes to the P-8A Project "may affect, but are not likely to adversely affect" marbled murrelets (*Brachyramphus marmoratus*) and bull trout (*Salvelinus confluentus*). The Navy also made a "no effect" determination on the golden paintbrush. The Service requested additional information regarding any proposed increase in base housing as a result of the proposed project. The current population of golden paintbrush on NAS Whidbey Island is being impacted by hydrologic changes in the area due, in part, to Navy housing and other construction in the area. The Service wanted to verify that the proposed project would not result in increased construction near the golden paintbrush population. Mr. Bianchi verified that the project would not result in increased construction.

On September 5, 2008, the Service concurred with your July 23, 2008, effects determination that the P-8A Project "may affect, but is not likely to adversely affect" the marbled murrelet and the Coastal-Puget Sound bull trout. The 2008 consultation analyzed the effects of the proposed action which included an upgrade to Ault Field to accommodate the addition of new aircraft and an increase in squadron operations. As no preferred alternative was identified in the 2008 Biological Assessment, the Service analyzed potential effects to listed species for the alternative that would result in the greatest impacts.

The Navy is assessing potential effects of basing the P-8A aircraft at two locations, NAS Whidbey Island and NAS Jacksonville, Florida. Since 2008, based on data analysis and training requirements, the Navy has determined that training fleet pilots would utilize a simulator for approximately 70 percent of their training with the remaining 30 percent of their training spent in the air. Three alternatives have been evaluated and compared to the "No Action Alternative" which is the alternative selected in the 2008 Record of Decision for the project.

The maximum construction footprint would disturb approximately 21.86 acres and includes:

1. Demolition of the existing Building 126 (P-3C simulator facility) and construction of a new two-story 0-8A trainer facility.

2. Expansion of the existing aircraft parking ramp and paving of additional area for aircraft parking.

3. Construction of a new P-8A hangar bay.

4. Renovation of existing Building 2771 for the Tactical Operations Center.

5. Construction of a Mobile Tactical Operations Center adjacent to Building 2771.

6. Expansions of Hangar 6 and hangar bay modification.

7. Construction of a Sensitive Compartmented Information Facility adjacent to Hangar 7.

8. Reuse of existing Building 2738 adjacent to the new trainer facility.

9. Construction of a Ground Support Equipment Shop and Outdoor Storage Area.

10. Reuse of Building 219.

The proposed construction of Alternative 2 (worst case alternative), would result in an increase of 15.76 acres of new impervious surface. The projected airfield operations under all three alternatives would be reduced by 20 to 25 percent.

The Service's 2008 consultation analyzed effects of stormwater runoff on listed species and forage fish and noise impacts to marbled murrelets and bull trout. The effects of the proposed alternatives will result in no change in stormwater or forage fish impacts, and a reduction in noise impacts that were analyzed in the 2008 project. Therefore, the Service concurs with your "may affect, not likely to adversely affect" determination for marbled murrelets and bull trout.

This concludes informal consultation in accordance with 50 CFR 402.13. The Navy must re-analyze this Endangered Species Act consultation if (1) new information reveals effects of the action that may affect listed species in a way not previously considered; (2) the action is modified in a manner that causes an effect to the listed species or critical habitat that was not previously considered; or (3) a new species is listed, or critical habitat designated, that may be affected by the identified action. If you have questions, please contact Jim Muck at (206) 526-4740, or by electronic mail at jim_muck@fws.gov.

Sincerely,

Martha L. Jensen

for Ken S. Berg, Manager
Washington Fish and Wildlife Office

cc:
NAS Whidbey Island, Oak Harbor, WA (M. Bianchi)

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/ 1025
July 17, 2013

The Honorable Thomas Wooten
Tribal Chair
Samish Indian Nation
PO Box 217
Anacortes, WA 98221

Dear Chairman Wooten:

SUBJECT: INTRODUCTION OF THE P-8A MULTI-MISSION AIRCRAFT INTO THE U.S. NAVY FLEET AT NAVAL AIR STATION WHIDBEY ISLAND IN OAK HARBOR, WASHINGTON

I would like to invite you to review the enclosed information and evaluate whether you believe there may be a potential for this action to significantly affect tribal treaty harvest rights or cultural resources from the implementation of the proposed action. This invitation is made pursuant to the Navy's policy for government-to-government consultation with American Indian and Alaska Native tribes. A description of the proposed action and preliminary assessment of impacts is enclosed.

The Navy is preparing a Supplemental Environmental Impact Statement (SEIS) for the introduction of P-8A Multi-Mission Maritime Aircraft (MMA) in accordance with the National Environmental Policy Act and Navy procedures. It is expected that the Draft SEIS will be released to the public in early September 2013. The Draft SEIS analyzes the environmental impacts of home basing 737 Poseidon jet aircraft at two locations; Jacksonville, FL and Whidbey Island, WA. The Draft SEIS analyzes facility requirements at NAS Whidbey Island not previously considered in the 2008 Final Environmental Impact Statement (EIS). The Navy has established a public web site for the Supplemental EIS: www.mmaseis.com. This public web site includes up-to-date information on the project, historic documentation (2008 FEIS), and schedule.

I respectfully request that you respond via written correspondence, and if appropriate, include information describing or depicting the potentially affected areas and resources within 60 days of receipt of this letter.

5090
Ser N44/ 1025
July 17, 2013

If you would like to initiate government-to-government consultation, please provide the name(s) and title(s) of the tribal officials to contact to coordinate our first meeting. I look forward to discussing your questions and concerns about this proposed project.

If you have questions or concerns, or require further information regarding the proposed undertaking please contact me directly at michael.nortier@navy.mil or (360) 257-2037, or have your staff contact Ms. Kendall Campbell, the installation Cultural Resources Program Manager at kendall.campbell1@navy.mil or (360) 257-6780.

Sincerely,

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Description of Action and Preliminary Analysis of Potential Impacts

P-8A MULTI-MISSION MARITIME AIRCRAFT (MMA) HOME BASING

Alternatives and Preliminary Analysis of Potential Impacts at NAS Whidbey Island

Supplemental EIS (SEIS) Alternatives

The SEIS will analyze one new home basing alternative not previously considered in the *Final Environmental Impact Statement for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet (hereinafter referred to as the 2008 Final EIS)* and will update the analysis of one alternative previously considered in the 2008 Final EIS. The 2008 Final EIS can be found in its entirety on the project Web site, www.mmaseis.com.

Alternative 1. Alternative 1 represents a new home basing alternative not previously considered. Alternative 1 considers the environmental effects of home basing six P-8A squadrons at NAS Whidbey Island, two additional squadrons over the previously proposed four squadrons in the 2008 Final EIS.

Alternative 2. Alternative 2 was previously analyzed in the 2008 Final EIS and considered home basing seven P-8A squadrons NAS Whidbey Island. For the purposes of the SEIS, Alternative 2 is analyzed in light of changes in circumstances and new information since issuance of 2008 Record of Decisions (ROD). These changes include increased emphasis on simulator training and an increase in the number of aircraft required in a squadron from 6 aircraft to 7 aircraft.

No Action Alternative. The No Action Alternative represents expected conditions at the time of a new home basing decision, April 2014, to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 ROD were to occur.

Refer to Section 2.2 of the Draft SEIS for a summary of siting alternatives. Refer to Section 2.4 of the Draft SEIS for details on facility requirements and number of aircraft, operations, and personnel.

Preliminary Analysis of Potential Impacts at NAS Whidbey Island

Airfield Operations and Noise. The increased use of simulators for P-8A pilot training would result in a 10% and 8% decrease in total airfield operations under Alternatives 1 and 2, respectively. The proposed action would result in a less than 1% increase in the off-station area within the greater than 65 dB DNL noise zone under both alternatives. The proposed action would result in a less than 1% decrease in population within the greater than 65 dB DNL noise zone. Refer to Section 6.2 of Draft SEIS for details. Figure 6-1 depicts the modeled noise contours.

Air Quality. There would be no adverse impacts to air quality. There is a projected decrease in operating emissions for most criteria pollutants. A slight increase in nitrogen oxide (NO_x) is estimated under Alternative 2. Construction emissions would be temporary. Refer to Section 6.3 of the Draft SEIS for details.

Socioeconomics. There would be no significant impacts to population and housing. The proposed action would result in a 0.2% decrease and a 0.5% increase in regional population under Alternatives 1 and 2, respectively. No significant impacts to the regional economy. An increase of $111M and $180M in economic benefits generated by one-time construction expenditures and a decrease of $8M and an increase of $25M in total military employee annual earnings under Alternatives 1 and 2, respectively. There would be no significant impact to local schools. The proposed action would result in a 0.7%

decrease and 1.8% increase in total school district enrollment under Alternatives 1 and 2, respectively. . Refer to Section 6.5 of the Draft SEIS for details.

Topography and Soils. There would be no significant impact to topography and soils from addition of fill material and approximately 9 or 16 acres of new impervious surface under Alternatives 1 and 2, respectively. Refer to Section 6.6 of the Draft SEIS for details.

Water Resources. There would be no impact to water resources with implementation of storm water control measures. Refer to Section 6.7 of the Draft SEIS for details.

Wetlands. No wetlands would be impacted under Alternative 1. Under Alternative 2, there would be approximately 1.64 acres of wetland fill. Wetlands removed to construct new facilities would be replaced at an approved mitigation site through the Section 404 permitting process. The Navy is coordinating with the U.S. Army Corps of Engineers (USACE) and the Washington Department of Ecology concurrently as part of the NEPA process and Section 404 permitting process. The Navy's request for a jurisdictional determination (JD) of wetland boundaries is currently under review by the USACE. A mitigation site at Crescent Harbor is proposed to offset wetland impacts. Refer to Section 6.7.5 and Appendix H of the Draft SEIS for details.

Biological Resources. There would be no significant impact to vegetation, wildlife, or marine mammals. There would be a permanent loss of approximately 9 to 16 acres of herbaceous vegetation under Alternatives 1 and 2, respectively. There would be no effect on golden Indian paintbrush, Steller sea lion, humpback whale, Southern resident killer whale, Puget Sound/Georgia Basin bocaccio, canary rockfish, yelloweye rockfish, southern euchalon, and southern North American green sturgeon populations. The proposed action may affect, but not likely to adversely affect, the marbled murrelet, Puget Sound Chinook salmon, Puget Sound steelhead, and Coastal Washington-Puget Sound bull trout. The U.S. Fish and Wildlife Service concurred with these findings in a letter dated May 13, 2013. Changes in construction and air operations planned under the proposed action alternative do not represent a significant project change sufficient to cause new or additional impacts to any National Marine Fisheries Service (NMFS)-managed species. Consequently, the Navy considers the 2008 NMFS concurrence to be valid for the proposed action alternatives. Refer to Section 6.8 and Appendix C of the Draft SEIS for details.

Cultural and Historic Resources. The Navy will consult with the Washington State Historic Preservation Officer (SHPO), appropriate tribes and other consulting parties under National Historic Preservation Act (NHPA) concurrently with, and as part of the environmental planning, NEPA process. Currently, the Navy's identified area of potential effect (APE) is not considered sensitive for archaeological resources. The Navy's preliminary assessment of the proposed P-8A MMA home basing at NAS Whidbey Island would have no effect on archaeological resources.

Although the Navy does not foresee any potential adverse effects to archaeological resources, the potential exists for accidental discovery. In case of an inadvertent discovery of Native American human remains and/or archaeological resources during construction, work at the site will cease and the Navy will immediately notify the Indian tribes likely to be culturally affiliated in compliance with 43 CFR 10.4.

Because the APE is located on or adjacent to the existing airfield, the Navy's preliminary assessment is there would be no significant affects to tribal treaty resources. Please refer to Section 6.9 of the Draft SEIS for details.

The Navy has identified the potential for an adverse effect on Hangar 6, a National Register eligible property and will be pursuing consultation pursuant to Section 106 of the NHPA.

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/ 1024
July 17, 2013

The Honorable Shawn Yanity
Tribal Chair
Stillaguamish Tribe of Indians of Washington
PO Box 277
Arlington, WA 98223

Dear Chairman Yanity:

SUBJECT: INTRODUCTION OF THE P-8A MULTI-MISSION AIRCRAFT INTO THE U.S. NAVY FLEET AT NAVAL AIR STATION WHIDBEY ISLAND IN OAK HARBOR, WASHINGTON

I would like to invite you to review the enclosed information and evaluate whether you believe there may be a potential for this action to significantly affect tribal treaty harvest rights or cultural resources from the implementation of the proposed action. This invitation is made pursuant to the Navy's policy for government-to-government consultation with American Indian and Alaska Native tribes. A description of the proposed action and preliminary assessment of impacts is enclosed.

The Navy is preparing a Supplemental Environmental Impact Statement (SEIS) for the introduction of P-8A Multi-Mission Maritime Aircraft (MMA) in accordance with the National Environmental Policy Act and Navy procedures. It is expected that the Draft SEIS will be released to the public in early September 2013. The Draft SEIS analyzes the environmental impacts of home basing 737 Poseidon jet aircraft at two locations; Jacksonville, FL and Whidbey Island, WA. The Draft SEIS analyzes facility requirements at NAS Whidbey Island not previously considered in the 2008 Final Environmental Impact Statement (EIS). The Navy has established a public web site for the Supplemental EIS: www.mmaseis.com. This public web site includes up-to-date information on the project, historic documentation (2008 FEIS), and schedule.

I respectfully request that you respond via written correspondence, and if appropriate, include information describing or depicting the potentially affected areas and resources within 60 days of receipt of this letter.

If you would like to initiate government-to-government consultation, please provide the name(s) and title(s) of the tribal officials to contact to coordinate our first meeting. I look forward to discussing your questions and concerns about this proposed project.

If you have questions or concerns, or require further information regarding the proposed undertaking please contact me directly at michael.nortier@navy.mil or (360) 257-2037, or have your staff contact Ms. Kendall Campbell, the installation Cultural Resources Program Manager at kendall.campbell1@navy.mil or (360) 257-6780.

Sincerely,

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Description of Action and Preliminary Analysis of Potential Impacts

P-8A MULTI-MISSION MARITIME AIRCRAFT (MMA) HOME BASING

Alternatives and Preliminary Analysis of Potential Impacts at NAS Whidbey Island

Supplemental EIS (SEIS) Alternatives

The SEIS will analyze one new home basing alternative not previously considered in the *Final Environmental Impact Statement for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet (hereinafter referred to as the 2008 Final EIS)* and will update the analysis of one alternative previously considered in the 2008 Final EIS. The 2008 Final EIS can be found in its entirety on the project Web site, www.mmaseis.com.

Alternative 1. Alternative 1 represents a new home basing alternative not previously considered. Alternative 1 considers the environmental effects of home basing six P-8A squadrons at NAS Whidbey Island, two additional squadrons over the previously proposed four squadrons in the 2008 Final EIS.

Alternative 2. Alternative 2 was previously analyzed in the 2008 Final EIS and considered home basing seven P-8A squadrons NAS Whidbey Island. For the purposes of the SEIS, Alternative 2 is analyzed in light of changes in circumstances and new information since issuance of 2008 Record of Decisions (ROD). These changes include increased emphasis on simulator training and an increase in the number of aircraft required in a squadron from 6 aircraft to 7 aircraft.

No Action Alternative. The No Action Alternative represents expected conditions at the time of a new home basing decision, April 2014, to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 ROD were to occur.

Refer to Section 2.2 of the Draft SEIS for a summary of siting alternatives. Refer to Section 2.4 of the Draft SEIS for details on facility requirements and number of aircraft, operations, and personnel.

Preliminary Analysis of Potential Impacts at NAS Whidbey Island

Airfield Operations and Noise. The increased use of simulators for P-8A pilot training would result in a 10% and 8% decrease in total airfield operations under Alternatives 1 and 2, respectively. The proposed action would result in a less than 1% increase in the off-station area within the greater than 65 dB DNL noise zone under both alternatives. The proposed action would result in a less than 1% decrease in population within the greater than 65 dB DNL noise zone. Refer to Section 6.2 of Draft SEIS for details. Figure 6-1 depicts the modeled noise contours.

Air Quality. There would be no adverse impacts to air quality. There is a projected decrease in operating emissions for most criteria pollutants. A slight increase in nitrogen oxide (NO_x) is estimated under Alternative 2. Construction emissions would be temporary. Refer to Section 6.3 of the Draft SEIS for details.

Socioeconomics. There would be no significant impacts to population and housing. The proposed action would result in a 0.2% decrease and a 0.5% increase in regional population under Alternatives 1 and 2, respectively. No significant impacts to the regional economy. An increase of $111M and $180M in economic benefits generated by one-time construction expenditures and a decrease of $8M and an increase of $25M in total military employee annual earnings under Alternatives 1 and 2, respectively. There would be no significant impact to local schools. The proposed action would result in a 0.7%

decrease and 1.8% increase in total school district enrollment under Alternatives 1 and 2, respectively. . Refer to Section 6.5 of the Draft SEIS for details.

Topography and Soils. There would be no significant impact to topography and soils from addition of fill material and approximately 9 or 16 acres of new impervious surface under Alternatives 1 and 2, respectively. Refer to Section 6.6 of the Draft SEIS for details.

Water Resources. There would be no impact to water resources with implementation of storm water control measures. Refer to Section 6.7 of the Draft SEIS for details.

Wetlands. No wetlands would be impacted under Alternative 1. Under Alternative 2, there would be approximately 1.64 acres of wetland fill. Wetlands removed to construct new facilities would be replaced at an approved mitigation site through the Section 404 permitting process. The Navy is coordinating with the U.S. Army Corps of Engineers (USACE) and the Washington Department of Ecology concurrently as part of the NEPA process and Section 404 permitting process. The Navy's request for a jurisdictional determination (JD) of wetland boundaries is currently under review by the USACE. A mitigation site at Crescent Harbor is proposed to offset wetland impacts. Refer to Section 6.7.5 and Appendix H of the Draft SEIS for details.

Biological Resources. There would be no significant impact to vegetation, wildlife, or marine mammals. There would be a permanent loss of approximately 9 to 16 acres of herbaceous vegetation under Alternatives 1 and 2, respectively. There would be no effect on golden Indian paintbrush, Steller sea lion, humpback whale, Southern resident killer whale, Puget Sound/Georgia Basin bocaccio, canary rockfish, yelloweye rockfish, southern euchalon, and southern North American green sturgeon populations. The proposed action may affect, but not likely to adversely affect, the marbled murrelet, Puget Sound Chinook salmon, Puget Sound steelhead, and Coastal Washington-Puget Sound bull trout. The U.S. Fish and Wildlife Service concurred with these findings in a letter dated May 13, 2013. Changes in construction and air operations planned under the proposed action alternative do not represent a significant project change sufficient to cause new or additional impacts to any National Marine Fisheries Service (NMFS)-managed species. Consequently, the Navy considers the 2008 NMFS concurrence to be valid for the proposed action alternatives. Refer to Section 6.8 and Appendix C of the Draft SEIS for details.

Cultural and Historic Resources. The Navy will consult with the Washington State Historic Preservation Officer (SHPO), appropriate tribes and other consulting parties under National Historic Preservation Act (NHPA) concurrently with, and as part of the environmental planning, NEPA process. Currently, the Navy's identified area of potential effect (APE) is not considered sensitive for archaeological resources. The Navy's preliminary assessment of the proposed P-8A MMA home basing at NAS Whidbey Island would have no effect on archaeological resources.

Although the Navy does not foresee any potential adverse effects to archaeological resources, the potential exists for accidental discovery. In case of an inadvertent discovery of Native American human remains and/or archaeological resources during construction, work at the site will cease and the Navy will immediately notify the Indian tribes likely to be culturally affiliated in compliance with 43 CFR 10.4.

Because the APE is located on or adjacent to the existing airfield, the Navy's preliminary assessment is there would be no significant affects to tribal treaty resources. Please refer to Section 6.9 of the Draft SEIS for details.

The Navy has identified the potential for an adverse effect on Hangar 6, a National Register eligible property and will be pursuing consultation pursuant to Section 106 of the NHPA.

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/ 1026
July 17, 2013

The Honorable Brian Cladoosby
Tribal Chair
Swinomish Indians of the Swinomish Reservation of Washington
11404 Moorage Way
La Conner, WA 98257

Dear Chairman Cladoosby:

SUBJECT: INTRODUCTION OF THE P-8A MULTI-MISSION AIRCRAFT INTO THE U.S. NAVY FLEET AT NAVAL AIR STATION WHIDBEY ISLAND IN OAK HARBOR, WASHINGTON

I would like to invite you to review the enclosed information and evaluate whether you believe there may be a potential for this action to significantly affect tribal treaty harvest rights or cultural resources from the implementation of the proposed action. This invitation is made pursuant to the Navy's policy for government-to-government consultation with American Indian and Alaska Native tribes. A description of the proposed action and preliminary assessment of impacts is enclosed.

The Navy is preparing a Supplemental Environmental Impact Statement (SEIS) for the introduction of P-8A Multi-Mission Maritime Aircraft (MMA) in accordance with the National Environmental Policy Act and Navy procedures. It is expected that the Draft SEIS will be released to the public in early September 2013. The Draft SEIS analyzes the environmental impacts of home basing 737 Poseidon jet aircraft at two locations; Jacksonville, FL and Whidbey Island, WA. The Draft SEIS analyzes facility requirements at NAS Whidbey Island not previously considered in the 2008 Final Environmental Impact Statement (EIS). The Navy has established a public web site for the Supplemental EIS: www.mmaseis.com. This public web site includes up-to-date information on the project, historic documentation (2008 FEIS), and schedule.

I respectfully request that you respond via written correspondence, and if appropriate, include information describing or depicting the potentially affected areas and resources within 60 days of receipt of this letter.

5090
Ser N44/ 1026
July 17, 2013

If you would like to initiate government-to-government consultation, please provide the name(s) and title(s) of the tribal officials to contact to coordinate our first meeting. I look forward to discussing your questions and concerns about this proposed project.

If you have questions or concerns, or require further information regarding the proposed undertaking please contact me directly at michael.nortier@navy.mil or (360) 257-2037, or have your staff contact Ms. Kendall Campbell, the installation Cultural Resources Program Manager at kendall.campbell1@navy.mil or (360) 257-6780.

Sincerely,

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Description of Action and Preliminary Analysis of Potential Impacts

P-8A MULTI-MISSION MARITIME AIRCRAFT (MMA) HOME BASING

Alternatives and Preliminary Analysis of Potential Impacts at NAS Whidbey Island

Supplemental EIS (SEIS) Alternatives

The SEIS will analyze one new home basing alternative not previously considered in the *Final Environmental Impact Statement for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet (hereinafter referred to as the 2008 Final EIS)* and will update the analysis of one alternative previously considered in the 2008 Final EIS. The 2008 Final EIS can be found in its entirety on the project Web site, www.mmaseis.com.

> **Alternative 1.** Alternative 1 represents a new home basing alternative not previously considered. Alternative 1 considers the environmental effects of home basing six P-8A squadrons at NAS Whidbey Island, two additional squadrons over the previously proposed four squadrons in the 2008 Final EIS.
>
> **Alternative 2.** Alternative 2 was previously analyzed in the 2008 Final EIS and considered home basing seven P-8A squadrons NAS Whidbey Island. For the purposes of the SEIS, Alternative 2 is analyzed in light of changes in circumstances and new information since issuance of 2008 Record of Decisions (ROD). These changes include increased emphasis on simulator training and an increase in the number of aircraft required in a squadron from 6 aircraft to 7 aircraft.
>
> **No Action Alternative.** The No Action Alternative represents expected conditions at the time of a new home basing decision, April 2014, to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 ROD were to occur.

Refer to Section 2.2 of the Draft SEIS for a summary of siting alternatives. Refer to Section 2.4 of the Draft SEIS for details on facility requirements and number of aircraft, operations, and personnel.

Preliminary Analysis of Potential Impacts at NAS Whidbey Island

Airfield Operations and Noise. The increased use of simulators for P-8A pilot training would result in a 10% and 8% decrease in total airfield operations under Alternatives 1 and 2, respectively. The proposed action would result in a less than 1% increase in the off-station area within the greater than 65 dB DNL noise zone under both alternatives. The proposed action would result in a less than 1% decrease in population within the greater than 65 dB DNL noise zone. Refer to Section 6.2 of Draft SEIS for details. Figure 6-1 depicts the modeled noise contours.

Air Quality. There would be no adverse impacts to air quality. There is a projected decrease in operating emissions for most criteria pollutants. A slight increase in nitrogen oxide (NO_x) is estimated under Alternative 2. Construction emissions would be temporary. Refer to Section 6.3 of the Draft SEIS for details.

Socioeconomics. There would be no significant impacts to population and housing. The proposed action would result in a 0.2% decrease and a 0.5% increase in regional population under Alternatives 1 and 2, respectively. No significant impacts to the regional economy. An increase of $111M and $180M in economic benefits generated by one-time construction expenditures and a decrease of $8M and an increase of $25M in total military employee annual earnings under Alternatives 1 and 2, respectively. There would be no significant impact to local schools. The proposed action would result in a 0.7%

decrease and 1.8% increase in total school district enrollment under Alternatives 1 and 2, respectively. . Refer to Section 6.5 of the Draft SEIS for details.

Topography and Soils. There would be no significant impact to topography and soils from addition of fill material and approximately 9 or 16 acres of new impervious surface under Alternatives 1 and 2, respectively. Refer to Section 6.6 of the Draft SEIS for details.

Water Resources. There would be no impact to water resources with implementation of storm water control measures. Refer to Section 6.7 of the Draft SEIS for details.

Wetlands. No wetlands would be impacted under Alternative 1. Under Alternative 2, there would be approximately 1.64 acres of wetland fill. Wetlands removed to construct new facilities would be replaced at an approved mitigation site through the Section 404 permitting process. The Navy is coordinating with the U.S. Army Corps of Engineers (USACE) and the Washington Department of Ecology concurrently as part of the NEPA process and Section 404 permitting process. The Navy's request for a jurisdictional determination (JD) of wetland boundaries is currently under review by the USACE. A mitigation site at Crescent Harbor is proposed to offset wetland impacts. Refer to Section 6.7.5 and Appendix H of the Draft SEIS for details.

Biological Resources. There would be no significant impact to vegetation, wildlife, or marine mammals. There would be a permanent loss of approximately 9 to 16 acres of herbaceous vegetation under Alternatives 1 and 2, respectively. There would be no effect on golden Indian paintbrush, Steller sea lion, humpback whale, Southern resident killer whale, Puget Sound/Georgia Basin bocaccio, canary rockfish, yelloweye rockfish, southern euchalon, and southern North American green sturgeon populations. The proposed action may affect, but not likely to adversely affect, the marbled murrelet, Puget Sound Chinook salmon, Puget Sound steelhead, and Coastal Washington-Puget Sound bull trout. The U.S. Fish and Wildlife Service concurred with these findings in a letter dated May 13, 2013. Changes in construction and air operations planned under the proposed action alternative do not represent a significant project change sufficient to cause new or additional impacts to any National Marine Fisheries Service (NMFS)-managed species. Consequently, the Navy considers the 2008 NMFS concurrence to be valid for the proposed action alternatives. Refer to Section 6.8 and Appendix C of the Draft SEIS for details.

Cultural and Historic Resources. The Navy will consult with the Washington State Historic Preservation Officer (SHPO), appropriate tribes and other consulting parties under National Historic Preservation Act (NHPA) concurrently with, and as part of the environmental planning, NEPA process. Currently, the Navy's identified area of potential effect (APE) is not considered sensitive for archaeological resources. The Navy's preliminary assessment of the proposed P-8A MMA home basing at NAS Whidbey Island would have no effect on archaeological resources.

Although the Navy does not foresee any potential adverse effects to archaeological resources, the potential exists for accidental discovery. In case of an inadvertent discovery of Native American human remains and/or archaeological resources during construction, work at the site will cease and the Navy will immediately notify the Indian tribes likely to be culturally affiliated in compliance with 43 CFR 10.4.

Because the APE is located on or adjacent to the existing airfield, the Navy's preliminary assessment is there would be no significant affects to tribal treaty resources. Please refer to Section 6.9 of the Draft SEIS for details.

The Navy has identified the potential for an adverse effect on Hangar 6, a National Register eligible property and will be pursuing consultation pursuant to Section 106 of the NHPA.

DEPARTMENT OF THE NAVY
NAVAL AIR STATION WHIDBEY ISLAND
OAK HARBOR, WASHINGTON 98278-5000

5090
Ser N44/ 1027
July 17, 2013

The Honorable Jennifer Washington
Tribal Chair
Upper Skagit Indian Tribe
25944 Community Plaza
Sedro Woolley, WA 98284

Dear Chairwoman Washington:

SUBJECT: INTRODUCTION OF THE P-8A MULTI-MISSION AIRCRAFT INTO THE U.S. NAVY FLEET AT NAVAL AIR STATION WHIDBEY ISLAND IN OAK HARBOR, WASHINGTON

I would like to invite you to review the enclosed information and evaluate whether you believe there may be a potential for this action to significantly affect tribal treaty harvest rights or cultural resources from the implementation of the proposed action. This invitation is made pursuant to the Navy's policy for government-to-government consultation with American Indian and Alaska Native tribes. A description of the proposed action and preliminary assessment of impacts is enclosed.

The Navy is preparing a Supplemental Environmental Impact Statement (SEIS) for the introduction of P-8A Multi-Mission Maritime Aircraft (MMA) in accordance with the National Environmental Policy Act and Navy procedures. It is expected that the Draft SEIS will be released to the public in early September 2013. The Draft SEIS analyzes the environmental impacts of home basing 737 Poseidon jet aircraft at two locations; Jacksonville, FL and Whidbey Island, WA. The Draft SEIS analyzes facility requirements at NAS Whidbey Island not previously considered in the 2008 Final Environmental Impact Statement (EIS). The Navy has established a public web site for the Supplemental EIS: www.mmaseis.com. This public web site includes up-to-date information on the project, historic documentation (2008 FEIS), and schedule.

I respectfully request that you respond via written correspondence, and if appropriate, include information describing or depicting the potentially affected areas and resources within 60 days of receipt of this letter.

If you would like to initiate government-to-government consultation, please provide the name(s) and title(s) of the tribal officials to contact to coordinate our first meeting. I look forward to discussing your questions and concerns about this proposed project.

If you have questions or concerns, or require further information regarding the proposed undertaking please contact me directly at michael.nortier@navy.mil or (360) 257-2037, or have your staff contact Ms. Kendall Campbell, the installation Cultural Resources Program Manager at kendall.campbell1@navy.mil or (360) 257-6780.

Sincerely,

MKN

M. K. NORTIER
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Description of Action and Preliminary Analysis of Potential Impacts

P-8A MULTI-MISSION MARITIME AIRCRAFT (MMA) HOME BASING

Alternatives and Preliminary Analysis of Potential Impacts at NAS Whidbey Island

Supplemental EIS (SEIS) Alternatives

The SEIS will analyze one new home basing alternative not previously considered in the *Final Environmental Impact Statement for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet (hereinafter referred to as the 2008 Final EIS)* and will update the analysis of one alternative previously considered in the 2008 Final EIS. The 2008 Final EIS can be found in its entirety on the project Web site, www.mmaseis.com.

Alternative 1. Alternative 1 represents a new home basing alternative not previously considered. Alternative 1 considers the environmental effects of home basing six P-8A squadrons at NAS Whidbey Island, two additional squadrons over the previously proposed four squadrons in the 2008 Final EIS.

Alternative 2. Alternative 2 was previously analyzed in the 2008 Final EIS and considered home basing seven P-8A squadrons NAS Whidbey Island. For the purposes of the SEIS, Alternative 2 is analyzed in light of changes in circumstances and new information since issuance of 2008 Record of Decisions (ROD). These changes include increased emphasis on simulator training and an increase in the number of aircraft required in a squadron from 6 aircraft to 7 aircraft.

No Action Alternative. The No Action Alternative represents expected conditions at the time of a new home basing decision, April 2014, to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 ROD were to occur.

Refer to Section 2.2 of the Draft SEIS for a summary of siting alternatives. Refer to Section 2.4 of the Draft SEIS for details on facility requirements and number of aircraft, operations, and personnel.

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decrease and 1.8% increase in total school district enrollment under Alternatives 1 and 2, respectively. . Refer to Section 6.5 of the Draft SEIS for details.

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Although the Navy does not foresee any potential adverse effects to archaeological resources, the potential exists for accidental discovery. In case of an inadvertent discovery of Native American human remains and/or archaeological resources during construction, work at the site will cease and the Navy will immediately notify the Indian tribes likely to be culturally affiliated in compliance with 43 CFR 10.4.

Because the APE is located on or adjacent to the existing airfield, the Navy's preliminary assessment is there would be no significant affects to tribal treaty resources. Please refer to Section 6.9 of the Draft SEIS for details.

The Navy has identified the potential for an adverse effect on Hangar 6, a National Register eligible property and will be pursuing consultation pursuant to Section 106 of the NHPA.

UNITED STATES MARINE CORPS
MARINE CORPS BASE HAWAII
BOX 63002 KANEOHE BAY, HAWAII 96863-3002

IN REPLY REFER TO:
5090
LE/160-13
August 6, 2013

CERTIFIED MAIL NO.: 7008 2810 0002 1216 3993

Mr. William Aila
State Historic Preservation Officer
Department of Land and Natural Resources
Kakuihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, HI 96707

RE: Section 106 Review: Introduction of the Multi-Mission Maritime Aircraft into the U.S. Navy Fleet at Marine Corps Base Hawaii, Kaneohe Bay, District Ko'olaupoko, Ahupua'a Kāne'ohe, Oahu, TMK 1-4-4-08:001.

Dear Mr. Aila:

Marine Corps Base (MCB) Hawaii is initiating consultation with your office in compliance with Section 106 of the National Historic Preservation Act (NHPA) regarding the Supplemental Environmental Impact Statement (EIS) for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet, in accordance with the National Environmental Policy Act (NEPA).

Project Description

In November 2008, the Department of Navy (DoN) completed the Final Environmental Impact Statement (FEIS) for the introduction of the P-8A aircraft into the U.S. Navy Fleet, which evaluated the environmental impacts of home basing 12 P-8A fleet squadrons (72 aircraft) and one Fleet Replacement Squadron (FRS) (12 aircraft) at established maritime patrol home bases (Navy 2008), which included home basing five fleet squadrons and the FRS at Naval Air Station (NAS) Jacksonville, Florida; four fleet squadrons at NAS Whidbey Island, Washington; and three fleet squadrons at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Hawaii, with periodic squadron detachments at NB Coronado, California. The purpose of the proposed action was to provide facilities and functions to support home basing the P-8A at established maritime patrol home bases; replacing the retiring P-3C aircraft. The Record of Decision (ROD) was signed on December 23, 2008, and published in the Federal Register (FR) on January 2, 2009 (74 FR 100). The ROD authorized three P-8A fleet squadrons (18 aircraft) at MCB Hawaii Kaneohe Bay.

Since this decision, the Navy has determined that home basing P-8A squadrons at two locations could provide potential cost savings while still meeting current strategic operational objectives. In the Supplemental EIS, the Navy evaluates two alternatives at two home basing locations, Whidbey Island, Washington and Jacksonville, Florida. Both alternatives consider a permanent rotating squadron detachment, consisting of two aircraft, operating from MCB Hawaii Kaneohe Bay. A rotating detachment would result in fewer personnel and a reduced facility footprint compared to the 2008 ROD. The Supplemental EIS analyzes the following alternatives:

Alternative 1. Alternative 1 considers the environmental effects of home basing P-8A squadrons at two locations: six fleet squadrons and the FRS at NAS Jacksonville and six fleet squadrons at NAS Whidbey Island.

Alternative 1 considers a permanent, rotating squadron detachment at MCB Hawaii Kaneohe Bay and periodic squadron detachments at NB Coronado.

Alternative 2. Alternative 2 considers the environmental effects of home basing P-8A squadrons at two locations: five fleet squadrons and the FRS at NAS Jacksonville and seven fleet squadrons at NAS Whidbey Island. Alternative 2 considers a permanent, rotating squadron detachment at MCB Hawaii Kaneohe Bay and periodic squadron detachments at NB Coronado.

Under Alternatives 1 and 2, office spaces will be upgraded in Hangar 104 and Building 6470 [Enclosures 1 and 2]. The upgrades in Hangar 104 include upgrading two interior office spaces with new paint, lights, phones, and local area network. A chain link fence enclosure will be installed within the eastern side of Hangar 104's open bay to secure support equipment. This fence will be bolted to the floor so that it can be removed when no longer needed.

In addition, the taxiway and shoulder at the aircraft parking apron would be expanded to accommodate a taxiway for the P-8A [see Enclosure 2]. This will include grading the edge of the taxiway and adjacent shoulder and repaving the area. The existing aircraft rinse facility would be expanded to accommodate the larger P-8A airframe. This includes paving the inner portion of the rinse facility turn around area.

IDENTIFICATION OF HISTORIC PROPERTY

As mentioned above, upgrades would be needed in Hangar 104 and Building 6470 as well as expansion of the taxiway and shoulder of the aircraft parking apron and expansion of the aircraft rinse facility [see Enclosures 1 and 2].

Hangar 104 was constructed in 1941 and is eligible for nomination to the National Register of Historic Places (NRHP) under Criteria A and C (Environmental Department 2011:19, 55-57). Modifications to the hangar roof were previously conducted so that the tail fin of the P-3 aircraft could fit into the hangar. Since this was an adverse effect to the hangar, HABS documentation (HABS No. HI-311-A) was conducted as mitigation. The interior renovations of Hangar 104 will include upgrading two interior office spaces with new paint and potential upgrades to lights, phones, and local area network. A chain link fence enclosure will be installed within the eastern side of Hangar 104's open bay to secure support equipment and will be removable. These modifications will not affect the exterior of the hangar. The office space renovations will upgrade the interior space so that they can continue to be used and will not affect the historic fabric of the hangar. It will not adversely affect this space since it leaves the ceiling visible and does not obstruct the feeling of the open bay.

Building 6470 was constructed in 1999 as a tactical support facility. It is not eligible for nomination to the NRHP.

The parking apron proposed for expansion is located west of B Street between 6th Street and 3rd Street. No known archaeological sites or deposits are located in this area. There is the potential for encountering sand fill in this area, and sand fill may contain Native American Graves Protection and Repatriation Act (NAGPRA) cultural items. Archaeological Site 4933, which consists of a buried cultural deposit, is located 95 m southwest of the parking apron (Schilz and Allen 1996; Rechtman and Wolforth 2000).

The aircraft rinse facility, composed of Facilities 6116 (oil-water separator) and 6117 (transfer shelter) was constructed in 1994. No archaeological sites or deposits are located within or adjacent to the rinse facility (Anderson 1997; Prishmont et al. 2001); however, sand fill was discovered during installation of the aircraft rinse facility. Two sites are located nearby. One site (Site 7411) consists of archaeological deposits and surface features consisting of rock alignments and rock concentrations (Filimoehala et al. 2013). This site is 70 m southeast of the aircraft rinse facility. The other site is the Mokapu Burial Area, which is located in the northern dunes that extend along the coastline of Mokapu Peninsula (Morrison 2010; Gosser 2005). The aircraft facility is located 110 m south of the Mokapu Burial Area.

AREA OF POTENTIAL EFFECT

The area of potential effect (APE) has been determined to include only the footprint of the proposed actions under Alternatives 1 and 2 for the P-8A Multi-Mission Maritime Aircraft supplemental EIS aboard MCB Hawaii.

DETERMINATION OF AFFECT

MCB Hawaii has determined that the proposed projects for the Supplemental EIS for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet, specifically the proposed detachment at MCB Hawaii Kaneohe Bay, will result in no adverse effect to historic properties affected in accordance with Section 106 Implementing Regulations at 36 CFR 800.4(d)(1) based on the following: 1) the area for the proposed taxiway extension and rinse facility expansion was previously disturbed and no archaeological sites or deposits are located within the proposed construction areas; 2) the proposed interior renovations of Hangar 104 will not be visible from the exterior of the building and will not alter the integrity of the hangar; and 3) an archaeologist will monitor excavations since sand fill has been identified in proposed ground disturbance areas in the event that NAGPRA cultural items (including human skeletal materials) are located in the sand fill material. If NAGPRA cultural items are discovered, all work in the vicinity will stop and the remains will be stabilized and protected. Treatment will proceed under the authority of NAGPRA.

We request your review and concurrence within 30 days of receipt of this letter. As defined in 36 CFR 800.5(c) we will assume your concurrence if no objection is received from your office within 30 days of receipt of this letter. Should you or your staff have any questions or concerns please contact the MCB Hawaii Cultural Resources Management staff, Ms. June Cleghorn at 257-7126 or via email at june.cleghorn@usmc.mil or Coral Rasmussen at 257-7134 or via email at coral.rasmussen@usmc.mil.

Sincerely,

D. R. GEORGE
Captain, U. S. Marine Corps
Director, Environmental Compliance and Protection Department
By direction of the Commanding Officer

Enclosures:
(1) Proposed construction areas for Alternatives 1 and 2 aboard MCB Hawaii.
(2) Proposed layout of planned facilities for Alternatives 1 and 2 aboard MCB Hawaii.

Copy to:
Ms. Ah Lan Diamond; Diamond 'Ohana
Ms. Nalani Olds; Olds 'Ohana
Ms. Delilah Ortiz; Ortiz 'Ohana
Ms. Emalia Keohokalole, Keohokalole 'Ohana
Ms. Clara Sweets Matthews; Ka Lahui Hawaii
Ms. Ella Paguyo; Paguyo 'Ohana
Ms. Chasmin Sokoloski; Prince Kuhio Hawaiian CC
Ms. Nau Kamalii; Boyd 'Ohana
Ms. Donna Ann Camvel; Paoa Kea Lono 'Ohana
Dr. Kamana'opono Crabbe; Office of Hawaiian Affairs
Mr. Cy Harris; Kekumano 'Ohana
Ms. Terrilee Napua Kekoolani Raymond; Kekoolani 'Ohana
Chair; Oahu Island Burial Council
Ms. Cathleen Mattoon; Koolauloa Hawaiian Civic Club
Mr. Edward Ayau; Hui Malama I Na Kupuna O Hawai'i Nei
Mr. Clive Cabral; Temple of Lono
Ms. Kaleo Paik
Ms. Kiersten Faulkner

Reference:

Anderson, Lisa
1997 Emergency Data Recovery in Conjunction with Milcon Project P-541 Aircraft Rinse Facility at Marine Corps Base Hawaii (MCBH), Kaneohe Bay, O' ahu, Hawai' i. Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command, Pearl Harbor, Hawaii. Ogden Environmental and Energy Services Co., Inc., Honolulu.

Environmental Compliance and Protection Department Marine Corps Base Hawaii
2011 *Historic Building Inventory: World War II Era Buildings aboard Marine Corps Base Hawaii, Kaneohe Bay.* Prepared by Environmental Compliance and Protection Department Marine Corps Base Hawaii, Kaneohe Bay, Hawai'i.

Filimoehala, Christopher, Timothy M. Rieth, and Robert Pacheco
2013 *Archaeological Monitoring and Testing in Support of the Geotechnical Survey for the MV-22 Hangar Site Investigation, Marine Corps Base Hawaii, Kaneohe Bay, O'ahu, Hawai'i.* Prepared for Commander, Pacific Division Naval Facilities Engineering Command, Pearl Harbor, Hawai'i. International Archaeological Research Institute, Inc., Honolulu.

Gosser, Dennis, and Mary Riford
2005 *Archaeological Monitoring of Cart Path Improvements Within Mōkapu Burial Area and Sand Dune Deposits Associated with the Klipper Golf Course, MCBH Kaneohe Bay, Island of O'ahu, Hawai'i.* Department of the Navy, Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawai'i. Pacific Consulting Services, Inc., Honolulu.

Prishmont Laura, Jane Allen, Stephan D. Clark
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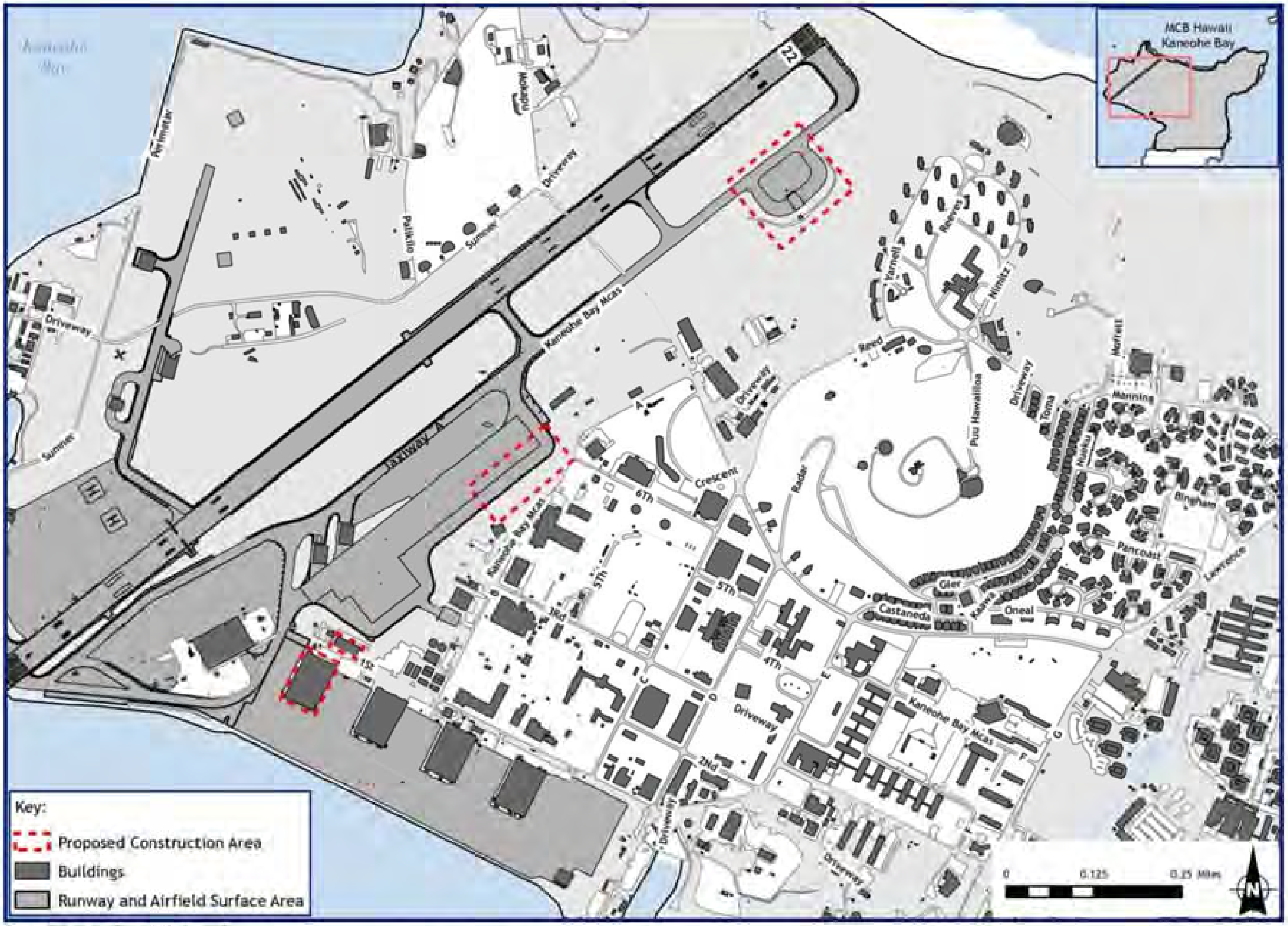
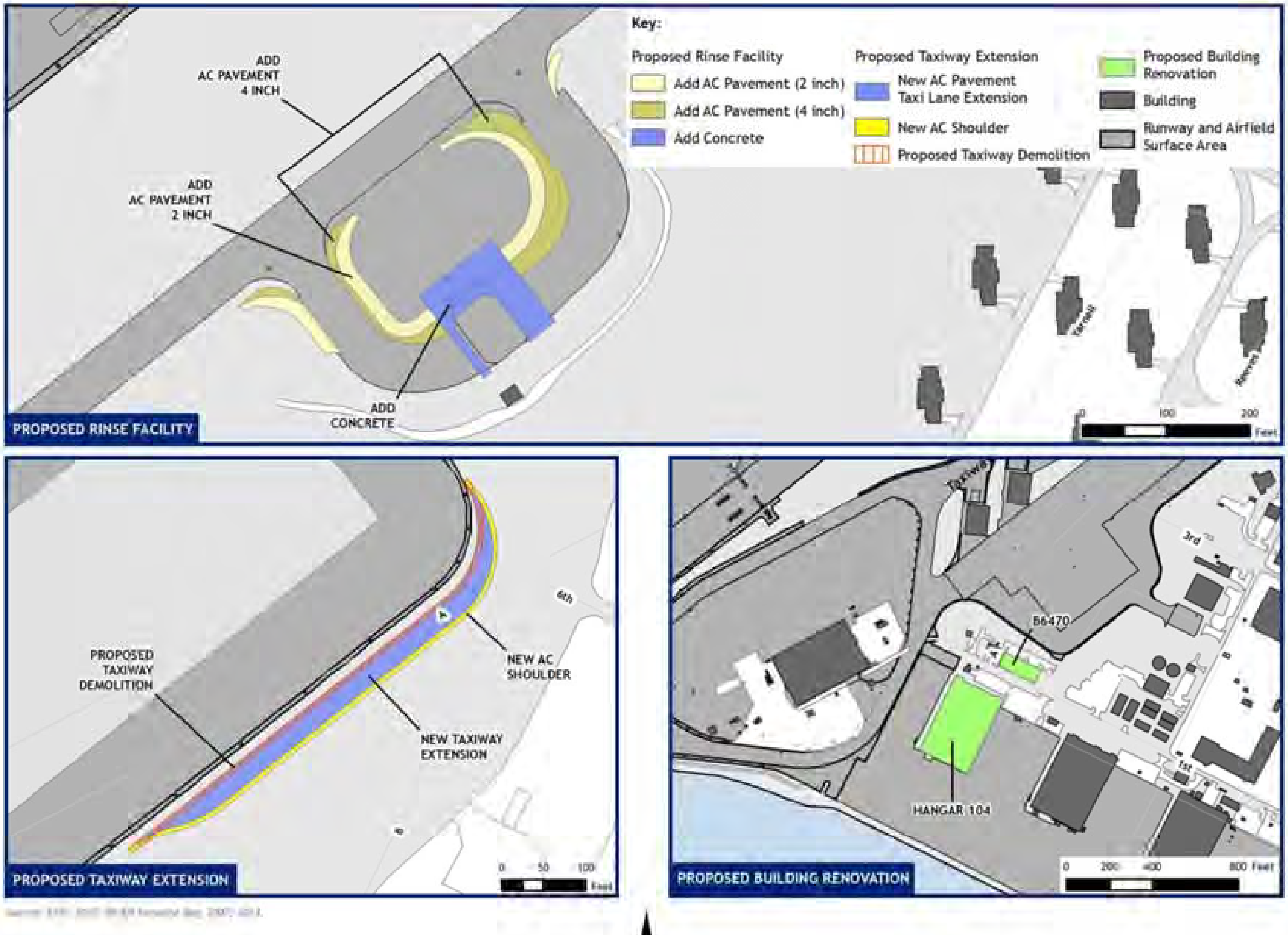


Enclosure 1. Proposed construction areas for Alternatives 1 and 2 aboard MCB Hawaii.



Enclosure 2. Proposed layout of planned facilities for Alternatives 1 and 2 aboard MCB Hawaii.

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Background Noise Information

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D.1 General Discussion of Noise

Noise is generally described as unwanted sound. A sound is regarded as noise when it interferes with normal activities such as sleep or conversation or when it is subjectively judged to be annoying. Noise analysis thus requires a combination of the physical description of sound produced by an activity and an identification of the potential responses to it.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium such as air. The measurement and human perception of sound involves three basic physical characteristics: amplitude, frequency, and duration. Amplitude is a measure of the strength of the sound and is directly measured in terms of the pressure of the sound wave. The greater the sound pressure, the more energy carried by the sound and, generally, the louder the perception of that sound. The second important physical characteristic of sound is frequency, which is the number of times per second the air vibrates. Frequency is sensed as pitch; low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by squeals or screeches. The third important characteristic of sound is duration, the length of time the sound can be detected.

The loudest sounds that the human ear can hear have an acoustic energy a trillion times that of sounds that can barely be detected. Because of this vast range, using a linear scale to represent the intensity of sound becomes unmanageable. Sound is therefore usually represented on a logarithmic scale with a unit called the decibel (dB) and is called a "sound level." A sound level of slightly above 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB; sound levels above 120 dB begin to be felt by the human ear as discomfort (Wyle 2012).

A small change in dB would not generally be noticeable. As the change in dB increases, individual perception is greater, as shown in Table D-1. The minimum change in sound level that the average human ear can detect is about 3 dB. On average, a person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness, and this relation holds true for both loud and quiet sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound intensity but only a 50 percent decrease in perceived loudness because of the nonlinear response of the human ear (similar to most human senses) (Wyle 2012).

Table D-1 Subjective Responses to Changes in A-Weighted Decibels

Change	Change in Perceived Loudness
1 dB	Requires close attention to notice
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic; twice or half as loud
20 dB	Striking; a four-fold change

Source: Wyle 2012

In terms of frequency, sound levels are "A-weighted," abbreviated as dBA, which reflects the human ear's sensitivity to different frequencies of sound. A-weighting is assumed for all sound level descriptors in this document.

Noise can potentially interfere with human daily activities. Ambient background noise in metropolitan, urbanized areas typically varies from 60 to 70 dB and can be as high as 80 dB or greater; quiet suburban neighborhoods experience ambient noise levels of approximately 45 to 50 dB (EPA 1978).

Individual response to noise levels varies and is influenced by many factors, including:

- The activity the individual is engaged in at the time of the noise,
- General sensitivity to noise,
- Time of day,
- Length of time an individual is exposed to a noise,
- Predictability of noise, and
- Average temperature.

Table D-2 provides a comparison of some everyday sounds, their corresponding dB levels, and how they are perceived by a listener.

Table D-2 Decibel Levels of Some Common Sounds

Sound Source (at a given distance)	Decibel Level (dB)
Gun Shot (at muzzle)	140-150
Jackhammer (50 feet)	120-125
Auto horn (3 feet)	115
Chain saw (operating)	105-115
Live rock concert (50 feet)	105-110
Circular saw (operating)	100-105
Shout (0.5 foot)	100
Squealing pigs (10 feet)	95-100
Combine (full throttle; 10 feet)	90-100
Subway station Heavy truck (50 feet)	90
Garbage disposal (3 feet)	80
Tractor (operating; enclosed cab)	75-80
Vacuum cleaner (3 feet)	70-80
Freeway traffic (50 feet)	70
Normal conversation (5 feet)	60-65
Air conditioning unit (20 feet)	60
Large electrical transformers (100 feet) Quiet suburb	45-55
Light auto traffic (50 feet)	50
Bird calls (distant) Library	35-45
Soft whisper (5 feet) Quiet rural area	25-35
Human breathing	10-20
Threshold of human hearing	0

Sources: Federal Interagency Committee on Noise (FICON) 1992

D.2 Noise Modeling

Aircraft noise consists of two major types of sound-generating events: aircraft takeoffs and landings, and engine maintenance operations, or run ups. The former can be described as intermittent sounds and the latter as continuous. Noise levels from flight operations exceeding ambient background sound levels typically occur beneath the arrival and departure flight tracks, or in traffic patterns around the airfield, and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft in flight gain altitude, their noise contribution drops to lower levels, often becoming indistinguishable from background noise.

Analysis of aircraft noise exposure around Department of Defense (DoD) facilities is normally accomplished using a group of computer-based programs, collectively called NOISEMAP. The NOISEMAP suite of computer programs was primarily developed by the Air Force, which serves as the lead DoD agency for aircraft noise modeling. Some of the factors considered in the noise model include:

- Type of operation (e.g., arrival, departure, pattern);
- Number of operations per day of aircraft types;
- Time of operation;
- Flight tracks;
- Aircraft power settings, speeds, and altitudes;
- Number, duration, power setting, and heading of maintenance run ups;
- Environmental data (temperature and humidity);
- Topographical features of the area; and
- Surface hardness.

Since flight operations dominate at an airfield, the resulting noise is highly variable. This variability is best assessed by time-average sound level metrics, such as the Day-Night Average Sound Level (DNL). DNL is a composite metric that averages all noise events for a 24-hour period, with a 10 dB penalty applied to nighttime events after 10:00 pm and before 7:00 am. It is an average quantity, mathematically representing the continuous A-weighted sound level that would be present if all of the variations in sound level that occur over a 24-hour period were smoothed out so as to contain the same total sound energy. It is a composite metric accounting for the maximum noise levels, the duration of the events (operations), and the number of events that occur over an average annual day. In general, scientific studies and social surveys have found a high correlation between the percentages of groups of people highly annoyed by a noise and the level of average noise exposure (e.g. DNL) (EPA 1978; Schultz 1978; Fidell et al. 1991). This correlation is shown on Figure D-1. The DNL has become the standard metric used by many federal and state governmental agencies and organizations, such as the Environmental Protection Agency (EPA) and the Federal Aviation Administration (FAA), for assessing aircraft noise.

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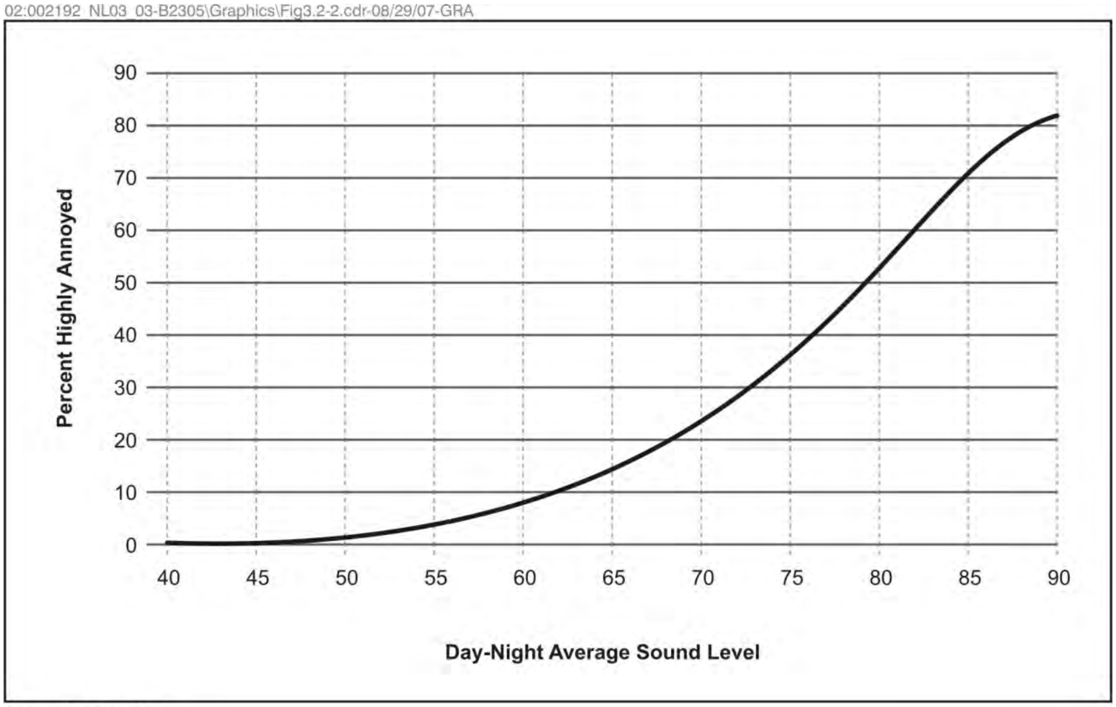

Source: Schultz 1978

Figure D-1 Influence of Sound Level on Annoyance

The 10-dB penalty in DNL added to nighttime noise events accounts for the added intrusiveness of sounds during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours. DNL does not represent the sound level heard at any particular time but is an expression of community reaction to noise.

The DNL for a community is depicted as a series of contours that connect points of equal value, usually in 5-dB increments. Calculated noise contours do not represent exact scientific measurements. The area between two specific contours is known as a noise zone. The noise zones used in this study range from 65 to 70 dB to 75 dB or greater.

In addition to presenting DNL values, which capture the average noise environment over a period of time for numerous events, the Sound Exposure Level (SEL) is used as a supplemental metric in this study to quantify the noise exposure related to a single event and to help describe the different aspects of noise. However, the DNL metric remains the primary accepted metric for measuring the impacts on the community from aircraft noise. SEL represents both the intensity (loudness) of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event, and a period of time during which the event is heard. SEL provides a measure of the net exposure to the entire acoustic event, but it does not directly represent the sound level heard at any given time. During an aircraft flyover, SEL would include both the maximum noise level and the lower noise levels produced during onset and recess periods of the overflight. The SEL describes the noise associated with a single event at a specific location. Aircraft noise varies from event to event according to aircraft type and model, aircraft configuration, engine power settings, aircraft speed, weather conditions, and distance between the observer and the aircraft.

D.3 Potential Hearing Loss

Another aspect of noise impacts to a community is the potential for noise-induced hearing loss. The 1982 EPA guidelines specifically address the criteria and procedures for assessing noise-induced hearing loss in terms of the Noise-Induced Permanent Threshold Shift (NIPTS), a quantity that defines the permanent change in hearing level, or threshold, caused by exposure to noise (EPA 1982). Numerically, the NIPTS is the change in threshold averaged over the frequencies 0.5, 1, 2, and 4 kilohertz (kHz) that can be expected from daily exposure to noise over a normal working lifetime of 40 years, with the exposure beginning at an age of 20 years. A grand average of the NIPTS over time (40 years) and hearing sensitivity (10^{th} to 90^{th} percentiles of the exposed population) is termed the average NIPTS. A 2009 DoD policy directive requires that hearing loss risk at military airbases be estimated for the at-risk population, defined as the population exposed to a DNL greater than or equal to 80 dB (DoD 2009). Specifically, DoD components are directed to "use the 80 DNL noise contour to identify populations at the most risk of potential hearing loss." The average NIPTS that can be expected for noise exposure as measured by the DNL metric is noted in Table D-3.

Table D-3 Average NIPTS and 10th Percentile NIPTS as a Function of DNL

DNL	Average NIPTS dB*	10^{th} Percentile NIPTS dB*
80-81	3.0	7.0
81-82	3.5	8.0
82-83	4.0	9.0
83-84	4.5	10.0
84-85	5.5	11.0
85-86	6.0	12.0
86-87	7.0	13.5
87-88	7.5	15.0
88-89	8.5	16.5
89-90	9.5	18.0

Notes: *Rounded to the nearest 0.5 dB

For example, for a noise exposure of 80 dB DNL, the expected lifetime average NIPTS is 3.0 dB, or 7.0 dB for the 10^{th} percentile (10 percent most sensitive population). Since hearing loss is a function of the actual sound levels rather than annoyance levels, characterizing the noise exposure in terms of DNL usually overestimates the assessment of hearing loss risk because DNL includes a 10-dB weighting factor for aircraft operations occurring at night.

For further details on noise and noise modeling, please see Wyle Noise Report WR-13-02 (Wyle 2013).

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SUPPLEMENTAL AIRCRAFT NOISE STUDY FOR THE INTRODUCTION OF P-8A MULTI-MISSION MARITIME AIRCRAFT

Advance Final

WR 13-02

September 2013

Supplemental Aircraft Noise Study for the Introduction of P-8A Multi-Mission Maritime Aircraft

Advance Final

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Acronyms & Abbreviations

ID	Definition
°F	degrees Fahrenheit
AAD	Annual Average Daily
AFE	Above Field Elevation
AGL	Above Ground Level
ANSI	American National Standards Institute
AOA	Angle of Attack
ASA	Acoustical Society of America
ATC	Air Traffic Control
CY	Calendar Year
dB	Decibel
DNL	Day-Night Average Sound Level
DNWG	Department of Defense Noise Working Group
DOD	Department of Defense
EA	Environmental Assessment
ELV	Elevation
EPA	Environmental Protection Agency
EPR	Engine Pressure Ratio
ESHP	Effective Shaft Horsepower
FCLP	Field Carrier Landing Practice
FEIS	Final Environmental Impact Statement
FICON	Federal Interagency Committee on Noise
fpm	Feet per minute
FRS	Fleet Replacement Squadron
ft	Feet
GCA	Ground Controlled Approach
HS	High School
Hz	Hertz
ID	Identification
IFR	Instrument Flight Rules
IMP	Impedance
in Hg or inHg	inches of mercury
ISHP	Indicated Shaft Horsepower
kts	Knots
LBS	pounds (thrust)
L_{eq}	Equivalent Sound Level
$L_{eq(24h)}$	Equivalent Sound Level over 24 hours
$L_{eq(8h)}$	Equivalent Sound Level over 8 hours
L_{max}	Maximum Sound Level
MMA	Multi-mission Maritime Aircraft
MSL	Mean Sea Level
NA	Number of Events At or Above a Selected Threshold

Acronyms and Abbreviations – *concluded*

ID	Definition
NAS	Naval Air Station
NASMOD	Naval Aviation Simulation Model
NASWI	Naval Air Station Whidbey Island
NC or %NC	Compressor RPM
NF or %NF	Fan RPM
NIPTS	Noise-induced Permanent Threshold Shift
NLR	Noise Level Reduction
NMAP	NOISEMAP
OLF	Outlying Landing Field
PA	Probability of Awakening
PHL	Potential Hearing Loss
POI	Point of Interest
RNM	Rotorcraft Noise Model
ROC	Rate of Climb
RPM	Revolutions Per Minute
SEIS	Supplemental Environmental Impact Statement
SEL	Sound Exposure Level
T&G	Touch-and-Go
US	United States
USGS	United States Geological Survey
VFR	Visual Flight Rules
WR	Wyle Report

Introduction and Executive Summary

In 2008, the Navy submitted a Final Environmental Impact Statement (FEIS) for the Introduction of the twin-jet P-8A Poseidon Multi-Mission Maritime Aircraft (MMA) (Navy 2008). The determination of noise impact for the FEIS was based on Wyle Report (WR) 07-22 (Amefia, K. et al 2008). Since the submission of the FEIS, the Navy has modified its basing plans for the P-8A with regard to Naval Air Station (NAS) Whidbey Island (NASWI) and NAS Jacksonville necessitating a Supplemental Environmental Impact Statement (SEIS).

In support of the Navy's SEIS, the primary purpose of this study is to determine the noise exposure for Baseline and two operational scenarios ("Alternatives") at NASWI and NAS Jacksonville related to the replacement of P-3C Orion four-engine turboprop aircraft with the new twin-jet P-8A. This replacement is expected to be completed in CY2020.

The Alternatives involve the introduction of up to 7 fleet squadrons of P-8A aircraft at NAS Jacksonville and NASWI and a P-8A Fleet Replacement Squadron (FRS) at NAS Jacksonville. The P-8A aircraft would replace up to 3 existing P-3 fleet squadrons at each of the two NAS. The P-8A aircraft would also replace the P-3 FRS at NAS Jacksonville.

Noise exposure was computed primarily in terms of Day-Night Average Sound Level (DNL) for annual average daily aircraft flight and run-up operations for each modeled scenario, utilizing the NOISEMAP suite of programs. The suite's Rotorcraft Noise Model (RNM) was also utilized for helicopter aircraft at NAS Jacksonville. Flight operations were heavily dependent on an associated Naval Aviation Simulation Model (NASMOD) studies (ATAC 2013a; ATAC 2013b).

DNL was computed for relevant and representative Points of Interest (POI) chosen by the Navy. Supplemental analyses, i.e., potential for sleep disturbance, speech interference and classroom learning interference, were also conducted for the POI. Potential Hearing Loss (PHL) was also estimated.

Relative to the Baseline scenario at NAS Jacksonville, Alternatives 1 and 2 would cause increases in the 65 dB DNL contour lengths to both the east and west of not more than 50 feet while the 65 dB DNL contour would not change or reduce in size for all other off-station areas. The relatively small change in DNL contour extents would be due the transient military tactical jets, modeled by the FA-18E/F Super Hornet, dominating the overall noise environment. The total computed DNL at each of five POI would only increase at Bolles High School by 1 dB to 55 dB DNL for both Alternatives due to the additional P-8A Touch and Go (T&G) pattern operations. Probability of awakening would decrease by up to two percent at all POI for both Alternatives because of the removal of P-3 T&G operations, which included a higher percentage of nighttime events than the proposed P-8A T&G operations that replace them. Although the P-8A is up to 10 dB greater in Sound Exposure Level (SEL) than the P-3, the fewer nighttime T&G operations dominate the changes in the probability of awakening. Non-school speech interfering events would reduce up to 1 event per hour at all POI for both Alternatives for the windows open condition and increase by 1 speech interfering event per hour for the windows closed condition at Ortega Farms Boulevard. All other POI would experience no change in speech interfering events for both Alternatives. The potential for indoor classroom learning interference would not change for either of the Alternatives at the one analyzed POI, Bolles High School. With off-station exposure less than 80 dB DNL, no off-station people would have a potential for hearing loss.

Relative to the Baseline scenario at NAS Whidbey Island, Alternatives 1 and 2 would cause increases in the 65 dB DNL contour extents of less than 100 feet because the EA-18G is the primary driver of the DNL contours and their operations would not change relative to Baseline. The P-3/P-8A operations are not sufficient in either SEL or numbers of operations to cause a noticeable change in the DNL contours. The total computed DNL at each of five POI would not increase for either of the Alternatives except the Olympic View Elementary School area would increase by 1 dB DNL for both Alternatives. Probability of awakening would increase by up to one percent at nearly all POI for both Alternatives due to the P-8A T&G pattern operations. Although the P-8A would conduct approximately the same number of T&G operations during DNL nighttime as the Baseline P-3 aircraft, the P-8A is up to 10 dB greater in SEL than the P-3. Non-school speech interfering events would increase by up to 1 event per hour at two of the six POI for both Alternatives due to the P-8A introduction/P-3 replacement. The potential for indoor classroom learning interference would not change for any of the Alternatives at the three analyzed POI, except for Clover Valley Day School which would experience an increase of 1 potentially interfering event per hour for Alternative 2. PHL in terms of numbers of people affected by a permanent threshold shift of at least 5 dB would be unchanged for either Alternative, relative to Baseline.

SECTION 1 Modeling Methodology

The following subsections provide a brief description of the modeled scenarios (1.1), describe the primary noise metrics and noise models used for the analysis (1.2 and 1.3) and the topographical and weather data (1.3). Section 1.4 concludes the chapter with a description of the methodology for conducting the supplemental noise analyses.

1.1 Description of Scenarios and Source of Operations

Table 1-1 lists the scenarios considered for this report. At NAS Jacksonville, the Baseline scenario includes 4 fleet squadrons P-8A aircraft and 2 fleet squadrons of P-3 aircraft. The Baseline scenario also consists of 1 Fleet Replacement Squadron (FRS) of P-8A and P-3 aircraft. Alternative 1 at NAS Jacksonville would replace all of Baseline's P-3 aircraft with 6 fleet squadrons and 1 FRS wholly consisting of P-8A aircraft. Alternative 2 would replace all of Baseline's P-3 aircraft with 5 fleet squadrons and 1 FRS wholly consisting of P-8A aircraft.

Table 1-1. Disposition of P-3 and P-8 Aircraft

Scenario	Aircraft Type	NAS Jacksonville	NAS Whidbey Island
Baseline	P-3	2 fleet squadrons + FRS (partial)	3 fleet squadrons + 1 EP-3 squadron
Baseline	P-8	4 fleet squadrons + FRS (partial)	None
Alternative 1	P-3	None	None
Alternative 1	P-8	6 fleet squadrons + FRS	6 fleet squadrons
Alternative 2	P-3	None	None
Alternative 2	P-8	5 fleet squadrons + FRS	7 fleet squadrons

At NASWI, the Baseline scenario includes no P-8A aircraft and is similar to the proposed action of the recently completed Environmental Assessment (EA) of the basing of VAQ Electronic Attack Squadrons of EA-18G Growler aircraft (Navy 2012). The Baseline scenario has 3 fleet squadrons of P-3 aircraft and 1 squadron of EP-3 aircraft. Alternative 1 at NASWI replaces all of the P-3 (and EP-3) aircraft with 6 fleet squadrons of P-8A aircraft. Alternative 2 replaces all of the P-3 (and EP-3) aircraft with 7 fleet squadrons of P-8A aircraft.

Annual flight operations for all scenarios were derived from results of Naval Aviation Simulation Model (NASMOD) studies (ATAC 2013a; ATAC2013b) conducted specifically for the purposes of the SEIS and validated by the Navy (Zahm 2013a; Zahm 2013b). NASMOD is a computer model built to evaluate the capacity of an airfield and associated airspace with respect to required aircraft operations. It generally derives its results from analyses of training syllabi for each squadron and type of aircraft and interviews of pilots, Air Traffic Control (ATC) personnel, and instructors. For noise studies, NASMOD results provide numbers of flight operations by squadron, aircraft type, time of day, runway, type of operation, and day of week.

For NAS Jacksonville, the NASMOD arrival and departure operations were slightly adjusted so they would balance. For NASWI, the NASMOD arrival and departure operations were already balanced. Other manipulations of the NASMOD data specifically for NAS Jacksonville and NASWI are described in Chapters 2 and 3, respectively. Alternative scenarios examine conditions during Calendar Year (CY) 2020, when aircraft introduction/replacement is fully completed.

1.2 Noise Metrics

The Federal Interagency Committee on Noise[1] (FICON) uses three types of metrics to describe noise exposure (FICON 1992):

1) A measure of the highest sound level occurring during an individual aircraft overflight;
2) A combination of the maximum level of that single event with its duration; and
3) A description of the cumulative noise environment based on all noise events over a period of time.

The DOD and other FICON members use Maximum Sound Level (L_{max}), Sound Exposure Level (SEL) and Day-Night Average Sound Level (DNL) for the aforementioned three types, respectively. In the context of aircraft noise, SEL is only associated with flight events. L_{max} is associated with flight and run-up events. The metrics in this study are presented in terms of A-weighted decibels (dB), which approximates the response and sensitivity of the human ear.

1.3 Noise Modeling Tools and Modeling Parameters

This section describes the analysis tools used to calculate the noise levels in this report: the NOISEMAP suites of computer programs, the topography modeling, and the weather conditions.

Analyses of aircraft noise exposure and compatible land uses around DOD airfield-like facilities are normally accomplished using a group of computer-based programs, collectively called NOISEMAP (Czech and Plotkin 1998; Wasmer and Maunsell 2006a; Czech 2008; Wasmer and Maunsell 2006b; Page, et al, 2008). The core computational programs of the NOISEMAP suite are NMAP and the Rotorcraft Noise Model (RNM). Modeling details are presented in Table 1-2. In this report, RNM Version 7.2 was only used to analyze the SH-60 helicopter operations at NAS Jacksonville. All other aircraft were modeled with NMAP Version 7.2.

The programs described above are most accurate and useful for comparing "before-and-after" noise levels that would result from alternative scenarios when calculations are made in a consistent manner. The programs allow noise exposure prediction of such proposed actions without actual implementation and/or noise monitoring of those actions.

The NOISEMAP suite of programs include atmospheric sound propagation effects over varying terrain, including hills and mountainous regions, as well as regions of varying acoustical impedance—for example, water around coastal regions. Elevation (ELV) and impedance (IMP) grid files were created to model the area surrounding the modeled airfields derived from U.S. Geological Survey (USGS) data (USGS 2011). ELV and IMP data for NAS Jacksonville was updated relative to WR 07-22 while modeling for NAS Whidbey Island used ELV and IMP files from WR 10-22 (Kester and Czech 2012). Details for topographical modeling is included in Table 1-2.

[1] DOD is a member of FICON.

Consistent with the most recent noise studies mentioned above, the following average monthly weather data listed in Table 1-2 were used for modeling.

Table 1-2. Noise Models, Methodology, and Weather

Noise Models			
Software	Version	Aircraft	
NMAP	7.2 (except Wyle version for NA calculations)	All except SH-60	
RNM	7.2.4	SH-60 (NAS Jacksonville)	
Parameter	Description		
Receiver Grid Spacing	500 ft in x and y		
Modeled Flying Days	365 days per year (Average Daily Events)		
Topography Modeling			
Elevation Data Source	USGS, U.S. Geological Survey. Internet site, http://seamless.usgs.gov		
Elevation and Impedance Grid spacing	300 feet in x and y		
Flow Resistivity of Land Areas	200 kPa-s/m^2		
Flow Resistivity of Water Areas	1,000,000 kPa-s/m^2		
Modeled Weather			
Airfield	Temperature (°F)	Relative Humidity (%)	Pressure (inHg)
NAS Jacksonville	70	62	29.92
NAS Whidbey Island	59	70	29.92
MCBH Kaneohe Bay	76	74	30.05

1.4 Supplemental Metrics Analyses

In addition to DNL, this noise study examined the potential for sleep disturbance, speech interference and classroom learning interference using metrics of Probability of Awakening (PA), Numbers of Events At or Above a Selected Threshold (NA), Equivalent Sound Level (L_{eq}) and the Potential Hearing Loss (PHL). The methodologies for these three analyses are described in the following subsections.

Common to all three analyses is the determination of indoor sound levels. The noise models compute the outdoor noise levels which must be converted to interior noise levels. For the purpose of this analysis typical Noise Level Reductions (NLR) of 15 dB and 25 dB were used to account for the effect of a typical home with windows open and windows closed, respectively (FICON 1992). The same NLR values were applied to schools.

All POI are considered to be at or near residential areas and relevant to sleep disturbance and speech interference analyses. Only school POI were relevant to the classroom learning interference analysis.

1.4.1 Potential for Sleep Disturbance

For sleep disturbance, the DOD guidelines (DNWG 2009) recommend the methodology and standard developed by American National Standards Institute (ANSI) and the Acoustical Society of America (ASA) in 2008 to compute the Probability of Awakening (PA) associated with outdoor noise events heard in homes and is a function of indoor SEL (ANSI 2008). In NOISEMAP and AAM, SEL only pertains to flight events thus the PA is only associated to flight events and not run-up events. Only DNL nighttime (10 p.m. to 7 a.m.) flight events were considered and only for residential locations. All school POI were included in the sleep disturbance analysis because each were determined to be near residential communities.

1.4.2 Potential for Indoor Speech Interference

For the analysis for the potential for indoor speech interference at each POI, the Number-of Events At or Above a Selected Noise Threshold (NA) metric was computed for flight and run-up events during DNL daytime (7 a.m. to 10 p.m.) period and the resultant NAs were summed. NA was computed with a proprietary version of NMAP.

The NA metric provides the total number of noise events greater than or equal to the selected noise level threshold during a specified period of time. The period of time can be an average 24-hour day, daytime, nighttime, school day, or any other time period appropriate to the nature and application of the analysis. The selected noise threshold for NA was indoor 50 dB L_{max} (DNWG 2009). L_{max} pertains to flight and run-up events.

1.4.3 Potential for Classroom Learning Interference

To analyze the potential for indoor classroom speech interference, two noise metrics were computed for each representative school: Equivalent Sound Level (L_{eq}) and NA 50 dB. Per the DOD guidelines, an appropriate set of criteria for speech interference in schools is an indoor L_{eq} of 40 dB (for intermittent noise) and a single-event indoor noise level of 50 dB L_{max} (DNWG 2009).

The school day is assumed to last eight hours from 8 a.m. through 4 p.m. and would be entirely contained within the DNL daytime period. Only those events occurring during the 8-hour school day are included for the indoor classroom speech interference analysis. The level of detail for aircraft flight operations was insufficient to differentiation between days of the week or months of the year so the analysis is based on annual average daily operations.

1.4.4 Potential Hearing Loss

Per a DOD policy memorandum (DOD 2009), Potential Hearing Loss (PHL) is assessed only for people exposed to DNL greater than or equal to 80 dB. Implementing the 2009 memo, a 2012 DOD technical bulletin draws from 1974 Environmental Protection Agency (EPA) guidelines (EPA 1974) and requires the $L_{eq(24h)}$ metric be used to assess the magnitude of the potential hearing loss for people exposed to DNL greater than or equal to 80 dB (DOD 2012). $L_{eq(24h)}$ is identical to DNL except $L_{eq(24h)}$ does not have a nighttime penalty. Thus $L_{eq(24h)}$ is typically less in magnitude than DNL.

Per the DOD bulletin, limiting the analysis to 80 dB DNL does not necessarily imply that populations exposed to DNL less than 80 dB are not at some degree of risk of hearing loss, but it is generally considered that this risk is small. Thus, for the purposes of this study, it is stated that people exposed to DNL less than 80 dB do not have a risk of significant PHL.

PHL is expressed in decibels of Noise-Induced Permanent Threshold Shift (NIPTS). As its name implies, NIPTS defines the permanent change in hearing level cause by exposure to noise. In accordance with DOD bulletin and EPA guidelines, two categories of NIPTS are reported herein – "average NIPTS" for most people's hearing sensitivity and "10th percentile NIPTS" for the 10 percent of people with highest sensitivity. The average NIPTS values are, in most cases, conservative as they assume a continuous exposure to $L_{eq(24h)}$ for a lifetime, i.e., 40 years starting at age 20 (EPA 1974).

NIPTS of less than 5 dB are generally not considered noticeable or significant. Furthermore, there is no known evidence that a NIPTS of 5 dB is perceptible or has any practical significance for the individual. Lastly, the EPA has stated the variability in audiometric testing is generally assumed to be ±5 dB (EPA 1974).

The population exposed to $L_{eq(24h)}$, but whose DNL is greater than or equal to 80 dB, is estimated with 2010 US Census block data using a geometric proportion method. This method assumes a uniform population distribution across each census block. The total population inside a noise contour band is assigned based on the portion of the census block that partially or wholly falls within the noise contour band boundary. If a noise contour band contains a portion of a block, then only the geographically based proportion of that block's population within that contour band is summed. If a census block is contained completely by the noise contour band, then 100 percent of the block's population is included in the estimates. The population data was further refined by removing any populated blocks whose population clearly does not intersect the noise contours via comparison of the noise contours and blocks to aerial imagery. No further refinement was done.

All on-station population was removed from the Census data prior to the population computation.

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SECTION 2

NAS Jacksonville

Section 2.1 discusses the existing conditions at NAS Jacksonville for the Baseline year (CY2014). Sections 2.2 and 2.3 explain the results for proposed Alternatives 1 and 2, respectively, for CY2020.

2.1 Baseline Scenario at NAS Jacksonville

The following subsections describe the modeled flight operations (2.1.1), runway and flight track utilization and modeled flight profiles (2.1.2), pre-flight and maintenance run-up operations (2.1.3), Baseline noise exposure and supplemental analyses (2.1.4).

2.1.1 Annual Flight Operations

Table 2-1 shows the annual flight operations for the modeled Baseline scenario. Modeled P-3 flight operations include C-130 Hercules operations. P-3 fleet operations were derived from twice the average squadron's tempo from the NASMOD's Calibrated Baseline scenario. P-3 FRS operations were derived from half of the NASMOD's Calibrated Baseline scenario's P-3 FRS operations. P-8A fleet operations were derived from four times the average P-8A fleet squadron operations from Alternatives 1 and 2. P-8A FRS operations were derived from half of the average P-8A FRS operations from Alternatives 1 and 2. NASMOD's "Transient Military Tactical Jets" were modeled with the FA-18E/F Super Hornet. See the notes of Tables 2-1 for additional detail.

Annual flight operations total 43,623 with approximately eight percent during the DNL nighttime period (2200-0700). Approximately 32, 31, and 20 percent of total Baseline flight operations are by the modeled P-3C, P-8A, and SH-60B aircraft, respectively. The FA-18E/F comprises only 2 percent of the total flight operations. Nearly half of the total modeled flight operations are Visual Flight Rules (VFR) Touch and Go (T&G) and Ground Controlled Approach (GCA) pattern operations in the vicinity of the NAS.

Nearly 3,500 flight operations (8 percent of the total) were not modeled as they consisted of small propeller and helicopter aircraft such as the Flying Club (T-34 Mentor), US Customs (Piper PA-42 Cheyenne twin turboprop), and transient general aviation aircraft such as the Beechcraft BE-20 King Air twin turboprop and transient helicopters. These operations would have a negligible contribution to the overall DNL for the NAS.

Average daily events were entered into the noise models, i.e., annual flight operations divided by 365 with pattern operations divided further by 2.

2.1.2 Runway/Flight Track Utilization and Modeled Flight Profiles

The runway and flight track utilization for this study was updated to correspond to the NASMOD study. See appendix for detailed tables. All modeled flight tracks remain unchanged except for 09D1, 09D2, 27D1 and 27D2 with the updated tracks depicted in Figure 2-1. The modeled flight profiles, except for the ones on the updated tracks, also are identical to those in WR 07-22.

Table 2-1. Annual Flight Operations at NAS Jacksonville for Baseline Scenario

Modeled Aircraft Type	Note	Departure			Visual Full Stop Arrival			Overhead Break Full Stop Arrival			Instrument Full Stop Arrival		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	2	364	-	364	299	1	300	24	-	24	39	1	40
C-5A	3	101	-	101	83	-	83	-	-	-	18	-	18
C-9A	4	85	-	85	72	-	72	-	-	-	13	-	13
B737-700	5	415	-	415	209	146	355	-	-	-	28	32	60
P-3C	6	2,101	56	2,157	1,588	221	1,809	-	-	-	289	60	349
E-2C	7	667	-	667	606	-	606	38	2	40	21	-	21
SH60B		3,810	-	3,810	2,952	858	3,810	-	-	-	-	-	-
P-8A	8	2,518	58	2,576	2,096	306	2,402	-	-	-	87	88	175
Modeled		10,061	114	10,175	7,905	1,532	9,437	62	2	64	495	181	676
Not Modeled	9	1,667	-	1,667	1,568	1	1,569	-	-	-	99	-	99
TOTAL		**11,728**	**114**	**11,842**	**9,473**	**1,533**	**11,006**	**62**	**2**	**64**	**594**	**181**	**775**

Modeled Aircraft Type	Note	Visual Touch and Go (1)			GCA Box (1)			TOTAL		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	**Day (0700-2200)**	**Night (2200-0700)**	**Total**
FA-18E/F	2	-	-	-	94	-	94	820	2	822
C-5A	3	-	-	-	10	-	10	212	-	212
C-9A	4	-	-	-	12	-	12	182	-	182
B737-700	5	-	-	-	22	-	22	674	178	852
P-3C	6	6,640	744	7,384	2,188	155	2,343	12,806	1,236	14,042
E-2C	7	-	-	-	70	-	70	1,402	2	1,404
SH60B		376	100	476	528	108	636	7,666	1,066	8,732
P-8A	8	6,115	402	6,517	2,029	185	2,214	12,845	1,039	13,884
Modeled		13,131	1,246	14,377	4,953	448	5,401	36,607	3,523	40,130
Not Modeled	9	-	-	-	158	-	158	3,492	1	3,493
TOTAL		**13,131**	**1,246**	**14,377**	**5,111**	**448**	**5,559**	**40,099**	**3,524**	**43,623**

Notes:
1) Each circuit counted as 2 operations.
2) Represents NASMOD's Transient Military Tactical Jets.
3) Represents NASMOD's Transient Military Heavy Jets; although ATAC estimates 93% of this category are C-17, conservatively modeled as C-5.
4) Represents NASMOD's "TRANSIENT_MIL_JET_TURBO" category.
5) Represents NASMOD's Transient Air Carrier and C-40 aircraft.
6) Includes C-130 operations modeled as P-3. P-3 fleet (2 squadrons) operations derived from twice the average squadron's tempo from the NASMOD Calibrated Baseline scenario; P-3 FRS operations derived from half of the NASMOD Calibrated Baseline operations.
7) Represents NASMOD's Transient Military Propeller aircraft.
8) Modeled as B737-700; fleet operations derived from four times the average fleet squadron ops from Alts 1 and 2; FRS operations derived from half of the average FRS ops from Alts 2 and 1.
9) Includes aircraft types not listed above such as US Customs aircraft, Flying Club, Transient General Aviation and Transient helicopter operations.

Source: maximum of NASMOD Alts 1 and 2 for all aircraft except P-3 fleet and FRS and P-8A fleet and FRS; see Notes.

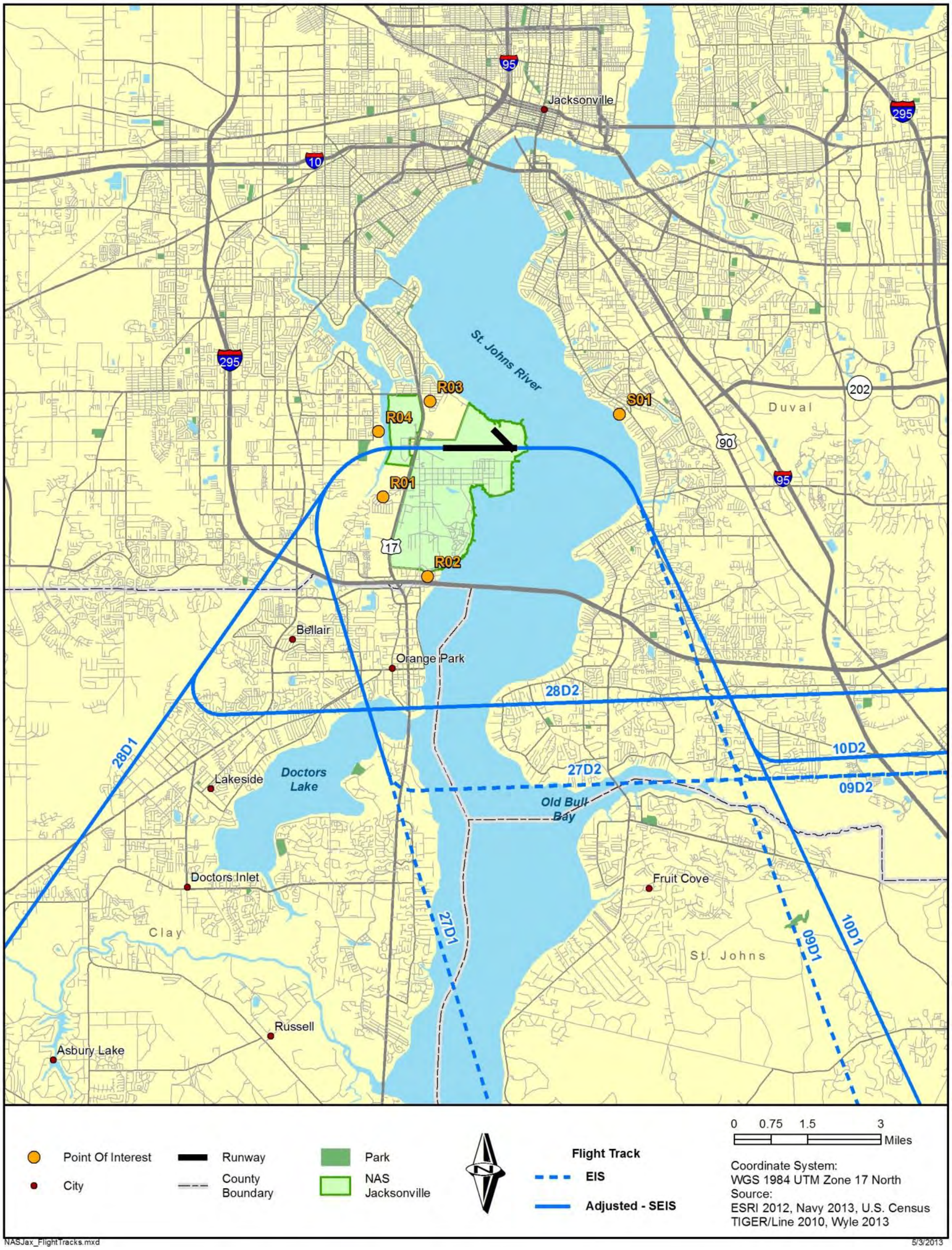

Figure 2-1. Updated Modeled Flight Tracks for NAS Jacksonville

2.1.3 Pre-flight and Maintenance Run-up Operations

Consistent with WR 07-22, there were no pre-flight run-ups modeled for any aircraft at NAS Jacksonville.

Maintenance run-ups were modeled at the same locations as WR 07-22 but operations were updated to correspond to the flight operations listed in Table 2-2. The locations are shown in Figure 2-2.

Table 2-2. Maintenance Run-up Operations at NAS Jacksonville for Baseline Scenario

Aircraft Type	Engine Type	Run-up Type	In-frame / Out-of-frame	Pad ID	Magnetic Heading (degrees)	Modeled Aircraft Type (if different)	Annual Events (1)	Percent Day (0700 - 2200)	Percent Night (2200 - 0700)	Reported Power Setting	Modeled Power Setting (if different)	Duration (Minutes) per Event	No. of Engines Running per Event
FA-18E/F	F414	Test	Out-of-frame	Hush House Building 777	360	F100-PW-100 in a Hush House	48	97%	3%	AB	Max AB	1	1
										96%	92% RPM	2	
										80%		2	
										72%	68% RPM	115	
										Total Duration		**120**	
				Test Cell Building 873	360	TEST CELL	40	70%	30%	AB	Max AB	9	1
										96%	100% RPM	72	
										72%	80% RPM	72	
										48%	70% RPM	27	
										Total Duration		**180**	
FA-18C/D	F404	Test	Out-of-frame	Test Cell Building 873	360	TEST CELL	12	70%	30%	AB	Max AB	6	1
										96%	100% RPM	48	
										72%	80% RPM	48	
										48%	70% RPM	18	
										Total Duration		**120**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	12	70%	30%	AB	Max AB	6	1
										96%	92% RPM	48	
										72%	80% RPM	48	
										48%	68% RPM	18	
										Total Duration		**120**	
EA-6B	J52	Test	Out-of-frame	Test Cell Building 873	360	TEST CELL	80	70%	30%	MIL	100% RPM	150	1
										86%	80% RPM	75	
										Idle	70% RPM	75	
										Total Duration		**300**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	80	70%	30%	MIL	92% RPM	150	1
										86%	80% RPM	75	
										Idle	68% RPM	75	
										Total Duration		**300**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	48	100%	0%	MIL	92% RPM	45	1
										86%	80% RPM	23	
										Idle	68% RPM	23	
										Total Duration		**90**	
P-3C (2)	T56-A-14	Test	Out-of-frame	Test Stand Building 201	270	P-3C in frame	12	100%	0%	Idle	120 ESHP	**80**	1
										482 ESHP	482 ESHP	**0**	
										MIL	4600 ESHP	**0**	
										Total Duration		**120**	
P-8A (3)	CFM56	Leak Check	Out-of-frame	Test Cell Building 873	360	TEST CELL	49	75%	25%	20% N1 (5400 Lbs)	70% RPM	5	1
		Pressure Check				TEST CELL	24	75%	25%	20% N1 (5400 Lbs)	70% RPM	12	1

Notes:
1) Events take place 365 days per year for modeling
2) P-3 ops from WR07-22 and scaled by numbers of flight operations
3) P-8 ops scaled down from Alternative 1 by ratio of flight operations

Figure 2-2. Maintenance Run-up Locations at NAS Jacksonville

2.1.4 Baseline Noise Exposure

Utilizing the data described in Sections 2.1.1 through 2.1.3, NMAP and RNM were used to calculate and plot the 65 dB through 85 dB DNL contours in increments of 5 dB for average daily aircraft events as shown in Figure 2-3. The 65 dB contour extends approximately 2.5 miles east and 2.5 miles west of Runway 09/27 primarily due to transient military tactical jet (modeled as FA-18E/F) arrivals and FA-18E/F GCA pattern arrivals, respectively. The 65 dB contour extends about 1 mile to the south and a half mile to the north of Runway 09/27 due to FA-18E/F departures. Although the FA-18E/F only accounts for 2 percent of the overall flight operations it is 5 to 20 dB greater in SEL than other aircraft at NAS Jacksonville so the FA-18E/F is responsible for a large portion of the DNL.

The total DNL at each of five POI was computed and is listed in Table 2-3. Both Ortega Hills Drive and Ortega Farms Boulevard experience the highest DNL of 60 dB. The remaining three locations are exposed to 55 dB DNL or less.

Table 2-3. DNL at NAS Jacksonville POI for Baseline Scenario

Point of Interest		DNL (dB)
ID	Description	
R01	Ortega Hills Drive	60
R02	Collins Road	47
R03	Timuquana Park	55
R04	Ortega Farms Boulevard	60
S01	Bolles High School	54

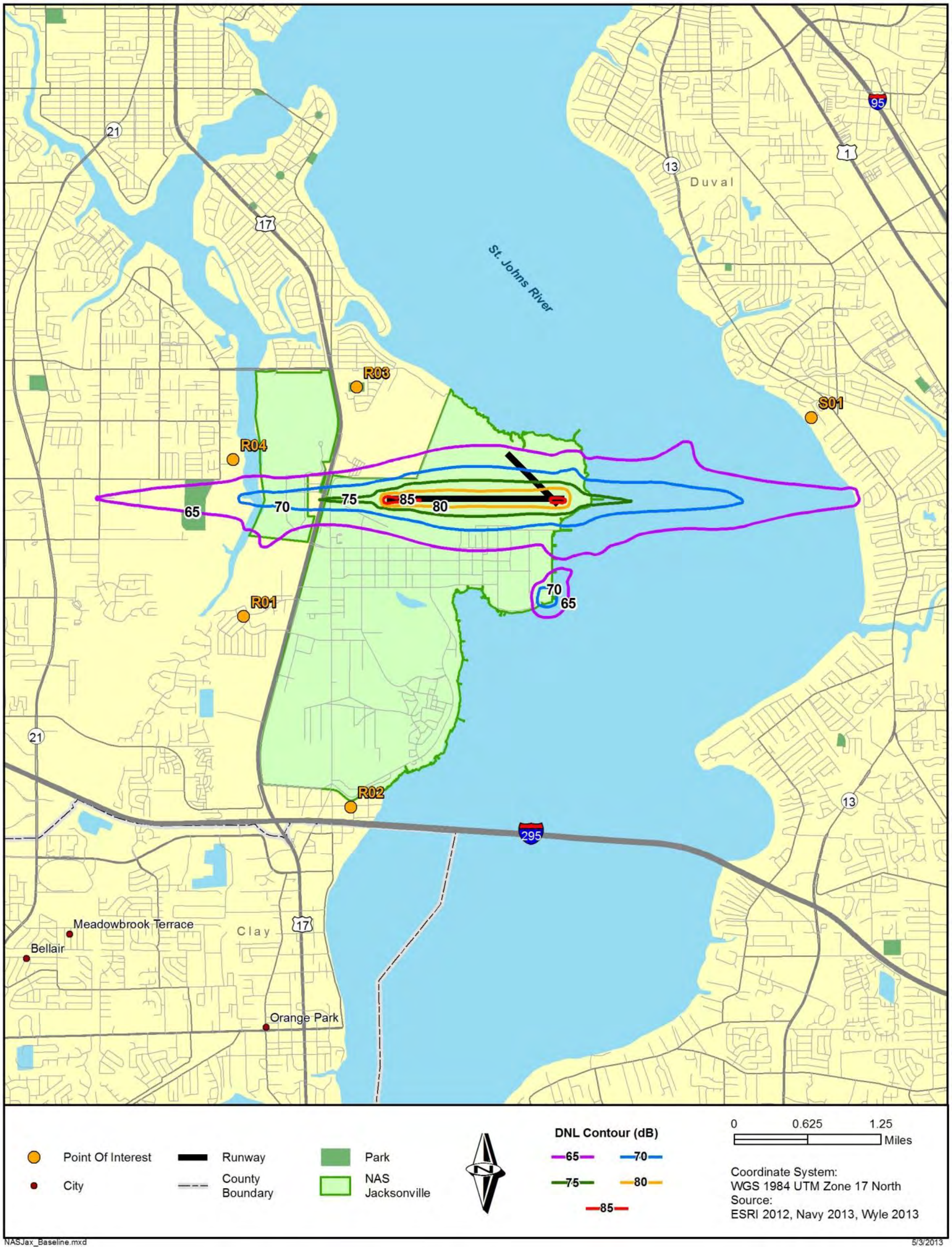

Figure 2-3. DNL Contours for Average Daily Aircraft Operations at NAS Jacksonville for Baseline Scenario

The Baseline aircraft operations were further analyzed to determine their relative effect on the overall DNL at the five POI. Figure 2-4 depicts the P-3C, P-8A, FA-18E/F, and Other (i.e. C-5A, C-9A, C-40 *B737), E-2C and SH60B) DNL contributions. At both Ortega Hills and Collins Road the P-8A accounts for the largest portion of the DNL with 57 dB of the total 60 dB and 44 dB of the total 47 dB, respectively. The three remaining POI are dominated by the FA-18E/F.

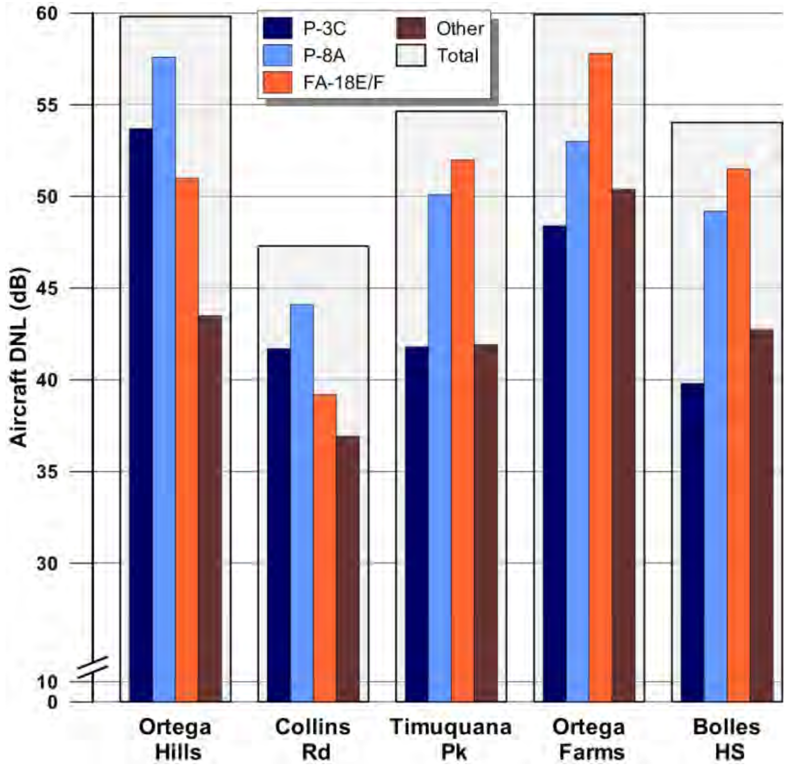

Figure 2-4. DNL Contributors at NAS Jacksonville POI for Baseline Scenario

2.1.4.1 Potential for Sleep Disturbance

Table 2-4 presents the results of the sleep disturbance analysis for the five POI. For Baseline, the PA ranges from 3 percent to 7 percent with windows open and ranges from 1 percent to 5 percent with windows closed. The P-8A T&G pattern operations are the primary contributor to the PA at all POI.

Table 2-4. Average Nightly (2200-0700) Probability of Awakening for NAS Jacksonville POI for Baseline Scenario

Point of Interest		Windows Open	Windows Closed
ID	Description		
R01	Ortega Hills Drive	6%	3%
R02	Collins Road	3%	1%
R03	Timuquana Park	5%	3%
R04	Ortega Farms Boulevard	7%	5%
S01	Bolles High School	5%	2%

*NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

2.1.4.2 Potential for Indoor Speech Interference

Table 2-5 present the results of the speech interference analysis for the Baseline scenario for the five POI. For the Baseline scenario, four of the five sites have more than one speech interfering event per daytime hour for windows open with the maximum of three events per hour occurring at Ortega Farms Boulevard. None of the sites have more than one speech interfering event per daytime hour for the windows closed conditions. Both the P-3 and the P-8A T&G pattern operations account for the majority of the speech interfering events at all POI.

Table 2-5. Potential for Average Daily Indoor Speech Interference for NAS Jacksonville POI for Baseline Scenario

Point of Interest		Indoor Number of Events per Daytime Hour*	
ID	Description	Windows Open	Windows Closed
R01	Ortega Hills Dr	2	1
R02	Collins Road	1	0
R03	Timuquana Park	2	1
R04	Ortega Farms Boulevard	3	1
S01	Bolles School	2	1
Number of Sites Exceeding 1 Intrusive Event per Hour		4	0
Minimum Number of Intrusive Events per Hour if Exceeding 1		2	0
Maximum Number of Intrusive Events per Hour if Exceeding 1		3	0

* Number of Annual Average Daily DNL Daytime Events At or Above an Indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

2.1.4.3 Potential for Classroom Learning Interference

Table 2-6 contains the results of the classroom learning interference analysis for Bolles High School (HS). For the Baseline scenario, aircraft noise at Bolles HS exceeds the indoor $L_{eq(8h)}$ threshold of 35 dB for continuous noise by 5 dB with windows open, primarily due to the FA-18E/F arrival operations to Runway 28. The majority of speech interfering events are due to the P-8A T&G patterns and the P-3 departures from Runway 10. The $L_{eq(8h)}$ criteria are not exceeded with windows closed. The interfering events are 2 and 1 for windows open and windows closed, respectively.

Table 2-6. Potential for Average Daily Indoor Classroom Learning Interference for NAS Jacksonville School POI for Baseline Scenario

School Point Of Interest		Outdoor	Indoor			
			Windows Open		Windows Closed	
ID	Description	$L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)
S01	Bolles High School	55	40	2	30	1

(1) Number of annual average busy day events per hour during 8 hour school day (8am-4pm) at or above an indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for windows open and closed, respectively.

2.1.4.4 Potential Hearing Loss

With off-station exposure less than 80 dB DNL, off-station people have a small (negligible) risk of PHL from aircraft noise for the Baseline scenario.

2.2 Alternative 1 at NAS Jacksonville

Alternative 1 includes the basing of an additional two P-8A fleet squadrons at NAS Jacksonville for a total of 6 fleet squadrons and transitioning the FRS squadron fully to P-8A aircraft. The P-3C aircraft would retire. The following subsections describe the modeled flight operations (2.2.1), runway and flight track utilization and modeled flight profiles (2.2.2), pre-flight and maintenance run-up operations (2.2.3), noise exposure (2.2.4), and the supplemental metrics analyses (2.2.5).

2.2.1 Flight Operations

Table 2-7 shows the annual flight operations for the modeled Alternative 1 scenario. Annual flight operations would total 40,143 with approximately seven percent during the DNL nighttime period (2200-0700). Approximately 60 and 22 percent of flight operations would be from the P-8A and SH-60B respectively. Approximately 46 percent of the modeled flight operations would be VFR T&G and GCA pattern operations in the vicinity of the NAS.

Nearly 3,500 annual flight operations (9 percent of the total) were not modeled as they would consist of small propeller and helicopter aircraft such as the Flying Club (T-34 Mentor), US Customs (Piper PA-42 Cheyenne twin turboprop), transient general aviation aircraft such as the Beechcraft BE-20 King Air twin turboprop and transient helicopters. These operations would have a negligible contribution to the overall DNL for the NAS.

Average daily events were entered into the noise models, i.e., annual flight operations divided by 365 with pattern operations divided further by 2.

2.2.2 Runway/ Flight Track Utilization and Modeled Flight Profiles

Alternative 1 would utilize the same runway and flight track utilization as Baseline as well as the same flight tracks and flight profiles.

2.2.3 Pre-flight and Maintenance Run-up Operations

Maintenance run-ups operations for Alternative 1 are identical to Baseline except for the removal of the P-3 and the increase in P-8A run-ups as shown in Table 2-8.

Table 2-7. Annual Flight Operations at NAS Jacksonville for Alternative 1

Modeled Aircraft Type	Note	Departure Day (0700-2200)	Departure Night (2200-0700)	Departure Total	Visual Full Stop Arrival Day (0700-2200)	Visual Full Stop Arrival Night (2200-0700)	Visual Full Stop Arrival Total	Overhead Break Full Stop Arrival Day (0700-2200)	Overhead Break Full Stop Arrival Night (2200-0700)	Overhead Break Full Stop Arrival Total	Instrument Full Stop Arrival Day (0700-2200)	Instrument Full Stop Arrival Night (2200-0700)	Instrument Full Stop Arrival Total
FA-18E/F	2	364	-	364	299	1	300	24	-	24	39	1	40
C-5A	3	101	-	101	83	-	83	-	-	-	18	-	18
C-9A	4	85	-	85	72	-	72	-	-	-	13	-	13
B737-700	5	415	-	415	209	146	355	-	-	-	28	32	60
P-3C	6	111	4	115	53	39	92	-	-	-	15	8	23
E-2C	7	667	-	667	606	-	606	38	2	40	21	-	21
SH60B		3,810	-	3,810	2,952	858	3,810	-	-	-	-	-	-
P-8A	8	4,254	103	4,357	3,625	452	4,077	-	-	-	143	137	280
Modeled		9,807	107	9,914	7,899	1,496	9,395	62	2	64	277	178	455
Not Modeled	9	1,667	-	1,667	1,568	1	1,569	-	-	-	99	-	99
TOTAL		**11,474**	**107**	**11,581**	**9,467**	**1,497**	**10,964**	**62**	**2**	**64**	**376**	**178**	**554**

Modeled Aircraft Type	Note	Visual Touch and Go (1) Day (0700-2200)	Visual Touch and Go (1) Night (2200-0700)	Visual Touch and Go (1) Total	GCA Box (1) Day (0700-2200)	GCA Box (1) Night (2200-0700)	GCA Box (1) Total	TOTAL Day (0700-2200)	TOTAL Night (2200-0700)	TOTAL Total
FA-18E/F	2	-	-	-	94	-	94	820	2	822
C-5A	3	-	-	-	10	-	10	212	-	212
C-9A	4	-	-	-	12	-	12	182	-	182
B737-700	5	-	-	-	22	-	22	674	178	852
P-3C	6	22	98	120	94	2	96	295	151	446
E-2C	7	-	-	-	70	-	70	1,402	2	1,404
SH60B		376	100	476	528	108	636	7,666	1,066	8,732
P-8A	8	11,086	554	11,640	3,408	238	3,646	22,516	1,484	24,000
Modeled		11,484	752	12,236	4,238	348	4,586	33,767	2,883	36,650
Not Modeled	9	-	-	-	158	-	138	3,492	1	3,493
TOTAL		**11,484**	**752**	**12,236**	**4,396**	**348**	**4,724**	**37,259**	**2,884**	**40,143**

Source: NASMOD Alt 1 for P-8 Fleet and FRS operations; maximum of NASMOD Alts 1 and 2 for for all aircraft.

Notes:
1) Each circuit counted as 2 operations
2) represents NASMOD's Transient Military Tactical Jets
3) represents NASMOD's Transient Military Heavy Jets; Although ATAC estimates 93% of this category are C-17, conservatively modeled as C-5.
4) represents NASMOD's "TRANSIENT_MIL_JET_TURBO" category;
5) represents NASMOD's Transient Air Carrier and C-40 aircraft
6) includes C-130 operations modeled as P-3.
7) represents NASMOD's Transient Military Propeller aircraft
8) Modeled as B737-700
Aviation and Transient helicopter operations

Table 2-8. Maintenance Run-up Operations at NAS Jacksonville for Alternative 1

Aircraft Type	Engine Type	Run-up Type	In-frame / Out-of-frame	Pad ID	Magnetic Heading (degrees)	Modeled Aircraft Type (if different)	Annual Events (1)	Percent Day (0700 - 2200)	Percent Night (2200 - 0700)	Reported Power Setting	Modeled Power Setting (if different)	Duration (Minutes) per Event	No. of Engines Running per Event
FA-18E/F	F414	Test	Out-of-frame	Hush House Building 777	360	F100-PW-100 in a Hush House	48	97%	3%	AB	Max AB	1	1
										96%	92% RPM	2	
										80%		2	
										72%	68% RPM	115	
										Total Duration		**120**	
				Test Cell Building 873	360	TEST CELL	40	70%	30%	AB	Max AB	9	1
										96%	100% RPM	72	
										72%	80% RPM	72	
										48%	70% RPM	27	
										Total Duration		**180**	
FA-18C/D	F404	Test	Out-of-frame	Test Cell Building 873	360	TEST CELL	12	70%	30%	AB	Max AB	6	1
										96%	100% RPM	48	
										72%	80% RPM	48	
										48%	70% RPM	18	
										Total Duration		**120**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	12	70%	30%	AB	Max AB	6	1
										96%	92% RPM	48	
										72%	80% RPM	48	
										48%	68% RPM	18	
										Total Duration		**120**	
EA-6B	J52	Test	Out-of-frame	Test Cell Building 873	360	TEST CELL	80	70%	30%	MIL	100% RPM	150	1
										86%	80% RPM	75	
										Idle	70% RPM	75	
										Total Duration		**300**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	80	70%	30%	MIL	92% RPM	150	1
										86%	80% RPM	75	
										Idle	68% RPM	75	
										Total Duration		**300**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	48	100%	0%	MIL	92% RPM	45	1
										86%	80% RPM	23	
										Idle	68% RPM	23	
										Total Duration		**90**	
P-3C (2)	T56-A-14	Test	Out-of-frame	Test Stand Building 201	270	P-3C in frame	0	100%	0%	Idle	120 ESHP	**80**	1
										482 ESHP	482 ESHP	**0**	
										MIL	4600 ESHP	**0**	
										Total Duration		**120**	
P-8A (3)	CFM56	Leak Check	Out-of-frame	Test Cell Building 873	360	TEST CELL	84	75%	25%	20% N1 (5400 Lbs)	70% RPM	5	1
		Pressure Check				TEST CELL	42	75%	25%	20% N1 (5400 Lbs)	70% RPM	12	1

Notes:
1) Events take place 365 days per year for modeling
2) P-3 ops from WR07-22 and scaled by numbers of flight operations
3) P-8 ops scaled down from Alternative 1 by ratio of flight operations

2.2.4 Alternative 1 Noise Exposure

Utilizing the data described in Sections 2.2.1 through 2.2.3, NMAP and RNM were used to calculate and plot the 65 dB through 85 dB DNL contours in increments of 5 dB for average daily aircraft events as shown in Figure 2-5. Similar to Baseline, the 65 dB contour would extend approximately 2.5 miles east and 2.5 miles west of Runway 09/27 primarily due to transient military tactical jet (FA-18E/F) arrival operations and FA-18E/F GCA pattern arrivals, respectively. The 65 dB contour would extend about 1 mile to the south and approximately 0.75 miles to the north of Runway 09/27 due to FA-18E/F departures, respectively. Although the FA-18E/F would only account for 2 percent of the overall flight operations it is 5 to 20 dB greater in SEL than other aircraft at NAS Jacksonville so the FA-18E/F would remain the dominant source for DNL.

The Alternative 1 65 dB and 75 dB DNL contours are compared to Baseline in Figure 2-6. The 65 dB DNL contour length to both the east and west would not change more than 50 feet because the effects of the P-3 and P-8A operational changes would be dominated by the FA-18E/F operations. The small lobe to the south, west of the station, would reduce in length by approximately 500 feet due to the reduction in T&G pattern events by the P-3 for Alternative 1. Although additional P-8A T&G operations would occur for Alternative 1, most of the additional operations would be during the DNL daytime and have minimal effect. The 75 dB DNL for Alternative 1 would be similar to Baseline.

The total DNL at each of five POI was computed and is listed in Table 2-9. Both Ortega Hills Drive and Ortega Farms Boulevard would experience the highest DNL of 60 dB. The remaining three locations would be exposed to 55 dB DNL or less. DNL at all locations would not change except at Bolles HS which would increase by 1 dB to 55 dB DNL due to the additional P-8A T&G pattern operations.

Table 2-9. DNL at NAS Jacksonville POI for Alternative 1

Point of Interest		DNL (dB)	Increase re Baseline (dB)
ID	Description		
R01	Ortega Hills Drive	60	-
R02	Collins Road	47	-
R03	Timuquana Park	55	-
R04	Ortega Farms Boulevard	60	-
S01	Bolles High School	55	+1

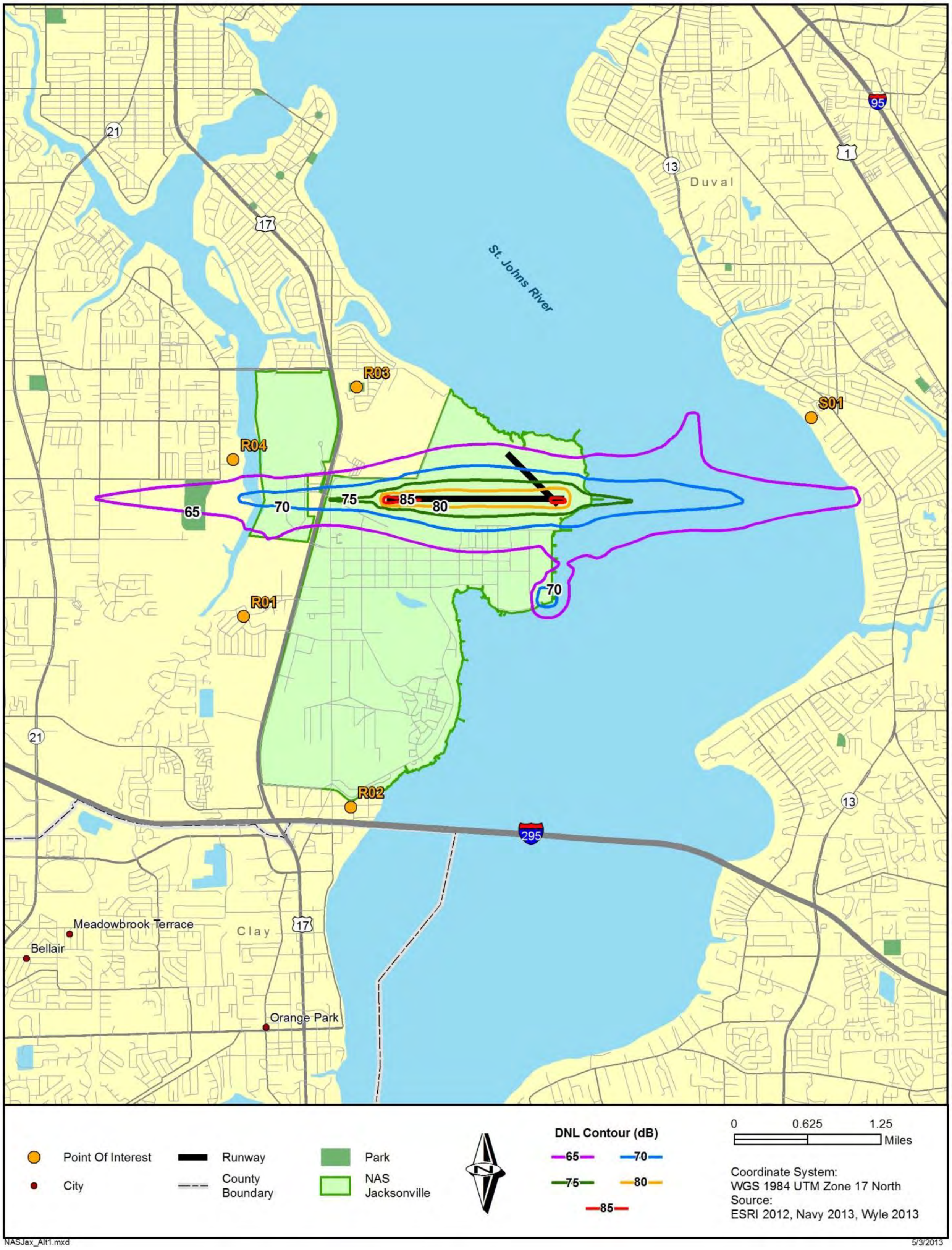

Figure 2-5. DNL Contours for Average Daily Aircraft Operations at NAS Jacksonville for Alternative 1

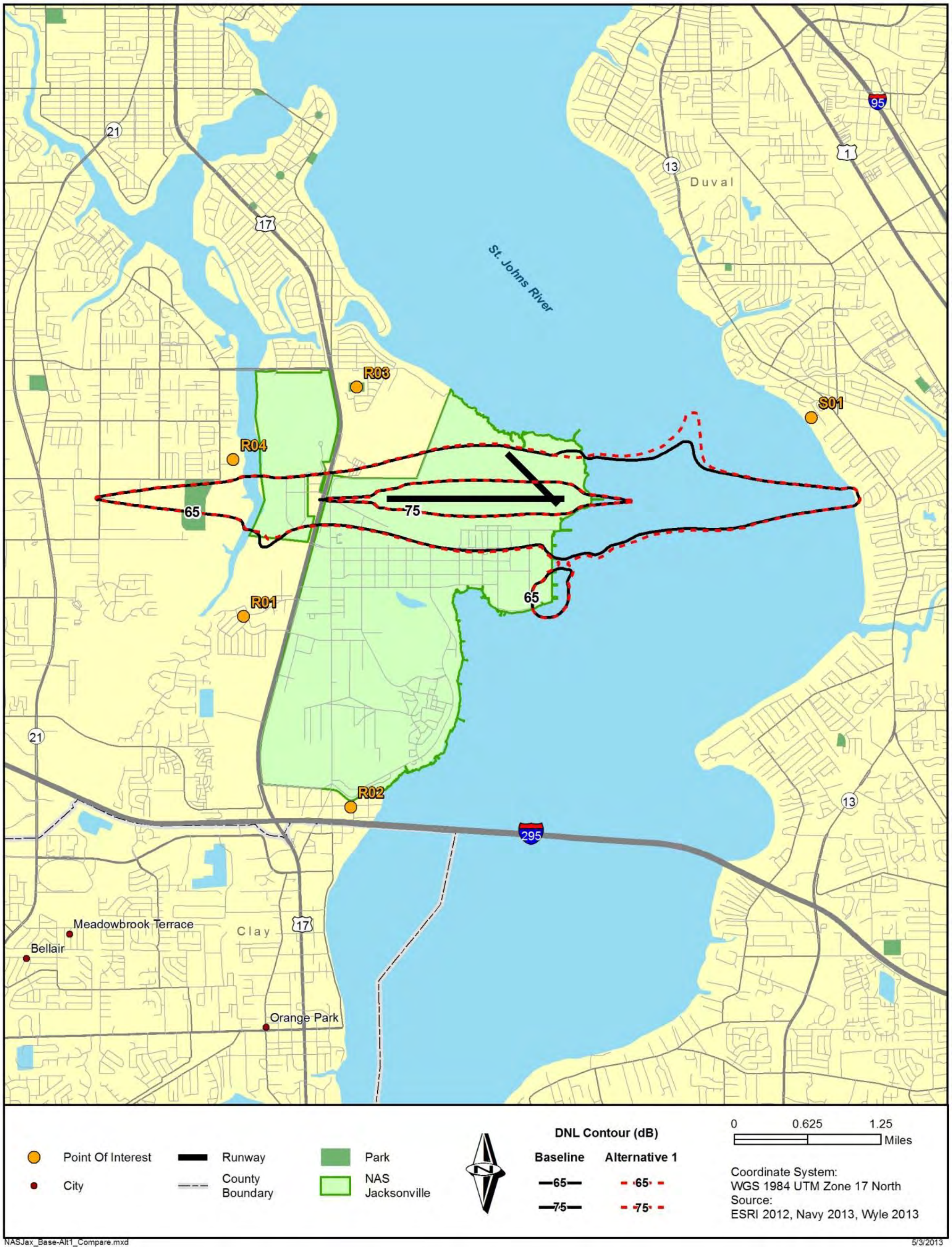

Figure 2-6. Comparison of Select DNL Contours at NAS Jacksonville for Baseline and Alternative 1 Scenarios

The aircraft operations were further analyzed to determine their relative effect on the overall DNL at the five POI. Figure 2-7 depicts the P-3C, P-8A, FA-18E/F, and Other aircraft's DNL contributions. At both Ortega Hills and Collins Road the P-8A would account for the largest portion of the DNL with 59 dB of the total 60 dB and 46 dB of the total 47 dB, respectively. This slight increase of 2 dB of in the P-8A contribution would have less than a 1 dB effect on total DNL at these locations. The increase in the P-8A contribution at Bolles HS would be approximately 3 dB greater than Baseline increasing the total DNL by 1 dB. The FA-18E/F would remain dominant as either the highest or second highest contributor to DNL at all five POI.

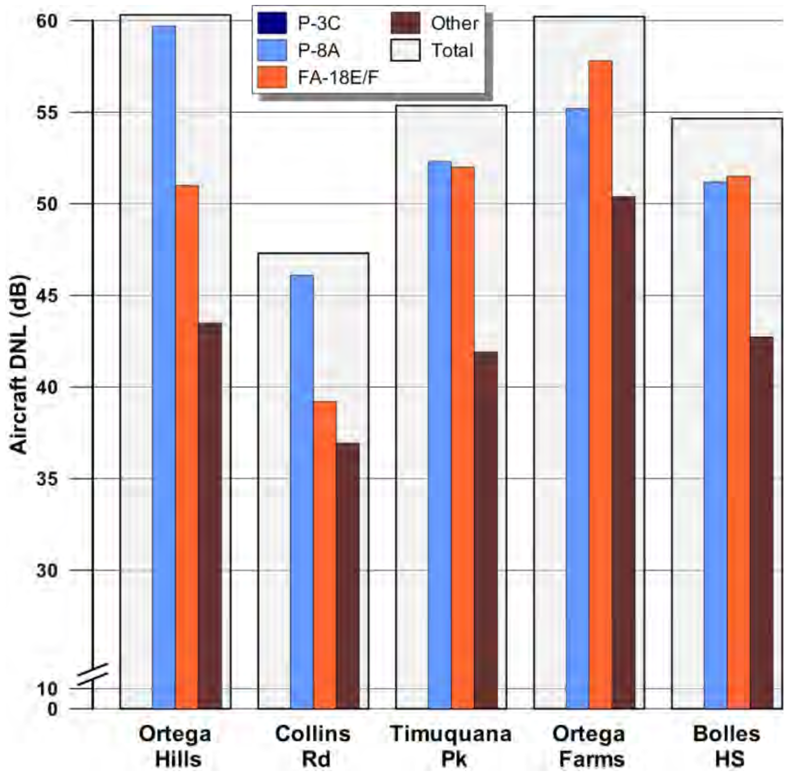

Figure 2-7. DNL Contributors at NAS Jacksonville POI for Alternative 1

2.2.4.1 Potential for Sleep Disturbance

Table 2-10 presents the results of the sleep disturbance analysis for the five POI. For Alternative 1, the PA would range from 2 percent to 6 percent with windows open and ranges from 1 percent to 4 percent with windows closed. The P-8A T&G pattern operations would remain the primary contributor to the PA at all POI. However, the removal of P-3 T&G operations, which included a higher percentage of nighttime events, would cause a net reduction of up to one percent in PA at four of the five POI.

Table 2-10. Average Nightly (2200-0700) Probability of Awakening for NAS Jacksonville POI for Alternative 1

Point of Interest		Alternative 1		Increase Re Baseline	
ID	Description	Windows Open	Windows Closed	Windows Open	Windows Closed
R01	Ortega Hills Drive	5%	2%	-1%	-1%
R02	Collins Road	2%	1%	-1%	-
R03	Timuquana Park	5%	2%	-1%	-
R04	Ortega Farms Boulevard	6%	4%	-1%	-1%
S01	Bolles High School	4%	3%	-	-

*NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

2.2.4.2 Potential for Indoor Speech Interference

Table 2-11 present the results of the speech interference analysis for Alternative 1 for the five POI. Three of the five sites would have more than one speech interfering event per daytime hour for windows open with the maximum of three events per hour occurring at Ortega Farms Boulevard. Only Ortega Farms Boulevard would have more than one speech interfering event per daytime hour for the windows closed conditions. The P-8A T&G pattern operations would account for the majority of the speech interfering events at all POI. The overall trend would be a small reduction in speech interfering events for the windows open condition due to the lower number of P-8A T&G pattern operations in Alternative 1. However, the P-8A is 5 to 10 dB greater in SEL than the P-3 it is replacing which would cause some additional P-8A pattern events to exceed the windows closed condition at Ortega Farms Boulevard that had not for the P-3.

Table 2-11 Potential for Average Daily Indoor Speech Interference for NAS Jacksonville POI for Alternative 1

Point of Interest		Indoor Number of Events per Daytime Hour*			
		Alternative 1		Increase Re Baseline	
ID	Description	Windows Open	Windows Closed	Windows Open	Windows Closed
R01	Ortega Hills Dr	1	1	-1	-
R02	Collins Road	1	0	-	-
R03	Timuquana Park	2	1	-	-
R04	Ortega Farms Boulevard	3	2	-	+1
S01	Bolles School	2	1	-	-
Number of Sites Exceeding 1 Intrusive Event per Hour		3	1	-1	+1
Minimum Number of Intrusive Events per Hour if Exceeding 1		2	2	-	+2
Maximum Number of Intrusive Events per Hour if Exceeding 1		3	2	-	+2

* Number of Annual Average Daily DNL Daytime Events At or Above an Indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for w indow s open and closed, respectively

2.2.4.3 Potential for Classroom Learning Interference

Table 2-12 contains the results of the classroom learning interference analysis for Bolles HS. Aircraft noise at Bolles HS would exceed the indoor $L_{eq(8h)}$ threshold of 35 dB for continuous noise by 5 dB with windows open, primarily due to the FA-18E/F arrival operations to Runway 28. The majority of speech interfering events would be due to the P-8A T&G patterns and the P-3 departures from Runway 10. The $L_{eq(8h)}$ criteria would not be exceeded with windows closed. The interfering events would be 2 and 1 for windows open and windows closed, respectively. There would be no change in either $L_{eq(8h)}$ or numbers of interfering events for Alternative 1, relative to Baseline.

Table 2-12. Potential for Average Daily Indoor Classroom Learning Interference for NAS Jacksonville School POI for Alternative 1

School Point Of Interest		Alternative 1					Increase re Baseline				
			Indoor					Indoor			
			Windows Open		Windows Closed			Windows Open		Windows Closed	
ID	Description	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)
S01	Bolles High School	55	40	2	30	1	0	0	0	0	0

(1) Number of annual average busy day events per hour during 8 hour school day (8am-4pm) at or above an indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for windows open and closed, respectively.

2.2.4.4 Potential Hearing Loss

With off-station exposure less than 80 dB DNL, off-station people would have a small (negligible) risk of PHL from aircraft noise for Alternative 1.

2.3 Alternative 2 at NAS Jacksonville

Alternative 2 includes the basing of one additional P-8A fleet squadron at NAS Jacksonville for a total of 5 fleet squadrons and transitioning the FRS squadron fully to P-8A aircraft. The P-3C aircraft would retire. The following subsections describe the modeled flight operations (2.3.1), runway and flight track utilization and modeled flight profiles (2.3.2), pre-flight and maintenance run-up operations (2.3.3), noise exposure and the supplemental analyses (2.3.4).

2.3.1 Flight Operations

Table 2-13 shows the annual flight operations for the modeled Alternative 2. Annual flight operations would total 38,964 with approximately seven percent during the DNL nighttime period (2200-0700). Approximately 59 and 22 percent of flight operations would be from the P-8A and SH-60B respectively. Approximately 46 percent of the modeled flight operations are VFR and GCA pattern operations in the vicinity of the NAS.

Nearly 3,500 annual flight operations (8 percent of the total) were not modeled as they would consist of small propeller and helicopter aircraft such as the Flying Club (T-34 Mentor), US Customs (Piper PA-42 Cheyenne twin turboprop), transient general aviation aircraft such as the Beechcraft BE-20 King Air twin turboprop and transient helicopters. These operations would have a negligible contribution to the overall DNL for the NAS.

Average daily events were entered into the noise models, i.e., annual flight operations divided by 365 with pattern operations divided further by 2.

Table 2-13. Annual Flight Operations at NAS Jacksonville for Alternative 2

Modeled Aircraft Type	Note	Departure Day (0700-2200)	Departure Night (2200-0700)	Departure Total	Visual Full Stop Arrival Day (0700-2200)	Visual Full Stop Arrival Night (2200-0700)	Visual Full Stop Arrival Total	Overhead Break Full Stop Arrival Day (0700-2200)	Overhead Break Full Stop Arrival Night (2200-0700)	Overhead Break Full Stop Arrival Total	Instrument Full Stop Arrival Day (0700-2200)	Instrument Full Stop Arrival Night (2200-0700)	Instrument Full Stop Arrival Total
FA-18E/F	2	364	-	364	299	1	300	24	-	24	39	1	40
C-5A	3	101	-	101	83	-	83	-	-	-	18	-	18
C-9A	4	85	-	85	72	-	72	-	-	-	13	-	13
B737-700	5	415	-	415	209	146	355	-	-	-	28	32	60
P-3C	6	111	4	115	53	39	92	-	-	-	15	8	23
E-2C	7	667	-	667	606	-	606	38	2	40	21	-	21
SH60B		3,810	-	3,810	2,952	858	3,810	-	-	-	-	-	-
P-8A	8	3,981	99	4,080	3,431	396	3,827	-	-	-	121	131	252
Modeled		9,534	103	9,637	7,705	1,440	9,145	62	2	64	255	172	427
Not Modeled	9	1,667	-	1,667	1,568	1	1,569	-	-	-	99	-	99
TOTAL		**11,201**	**103**	**11,304**	**9,273**	**1,441**	**10,714**	**62**	**2**	**64**	**354**	**172**	**526**

Modeled Aircraft Type	Note	Visual Touch and Go (1) Day (0700-2200)	Visual Touch and Go (1) Night (2200-0700)	Visual Touch and Go (1) Total	GCA Box (1) Day (0700-2200)	GCA Box (1) Night (2200-0700)	GCA Box (1) Total	TOTAL Day (0700-2200)	TOTAL Night (2200-0700)	TOTAL Total
FA-18E/F	2	-	-	-	94	-	94	820	2	822
C-5A	3	-	-	-	10	-	10	212	-	212
C-9A	4	-	-	-	12	-	12	182	-	182
B737-700	5	-	-	-	22	-	22	674	178	852
P-3C	6	22	98	120	94	2	96	295	151	446
E-2C	7	-	-	-	70	-	70	1,402	2	1,404
SH60B		376	100	476	528	108	636	7,666	1,066	8,732
P-8A	8	10,686	556	11,242	3,148	272	3,420	21,367	1,454	22,821
Modeled		11,084	754	11,838	3,978	382	4,360	32,618	2,853	35,471
Not Modeled	9	-	-	-	158	-	138	3,492	1	3,493
TOTAL		**11,084**	**754**	**11,838**	**4,136**	**382**	**4,498**	**36,110**	**2,854**	**38,964**

Source: NASMOD Alt 2 for P-8 Fleet and FRS operations; maximum of NASMOD Alts 1 and 2 for for all other aircraft.

1) Each circuit counted as 2 operations
2) represents NASMOD's Transient Military Tactical Jets
3) represents NASMOD's Transient Military Heavy Jets; Although ATAC estimates 93% of this category are C-17, conservatively modeled as C-5.
4) represents NASMOD's "TRANSIENT_MIL_JET_TURBO" category;
5) represents NASMOD's Transient Air Carrier and C-40 aircraft
6) includes C-130 operations modeled as P-3.
7) represents NASMOD's Transient Military Propeller aircraft
8) Modeled as B737-700
9) Includes aircraft types not listed above such as US Customs aircraft, Flying Club, Transient General Aviation and Transient helicopter operations

2.3.2 Runway/ Flight Track Utilization and Modeled Flight Profiles

Alternative 2 would utilize the same runway and flight track utilization as Baseline as well as the same flight tracks and flight profiles.

2.3.3 Pre-flight and Maintenance Run-up Operations

Maintenance run-ups operations for Alternative 2 would be identical to Baseline except for the removal and the P-3 and the increase in P-8A run-ups as shown in Table 2-14.

Table 2-14. Maintenance Run-up Operations at NAS Jacksonville for Alternative 2

Aircraft Type	Engine Type	Run-up Type	In-frame / Out-of-frame	Pad ID	Magnetic Heading (degrees)	Modeled Aircraft Type (if different)	Annual Events (1)	Percent Day (0700 - 2200)	Percent Night (2200 - 0700)	Reported Power Setting	Modeled Power Setting (if different)	Duration (Minutes) per Event	No. of Engines Running per Event
FA-18E/F	F414	Test	Out-of-frame	Hush House Building 777	360	F100-PW-100 in a Hush House	48	97%	3%	AB	Max AB	1	1
										96%	92% RPM	2	
										80%		2	
										72%	68% RPM	115	
										Total Duration		**120**	
				Test Cell Building 873	360	TEST CELL	40	70%	30%	AB	Max AB	9	1
										96%	100% RPM	72	
										72%	80% RPM	72	
										48%	70% RPM	27	
										Total Duration		**180**	
FA-18C/D	F404	Test	Out-of-frame	Test Cell Building 873	360	TEST CELL	12	70%	30%	AB	Max AB	6	1
										96%	100% RPM	48	
										72%	80% RPM	48	
										48%	70% RPM	18	
										Total Duration		**120**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	12	70%	30%	AB	Max AB	6	1
										96%	92% RPM	48	
										72%	80% RPM	48	
										48%	68% RPM	18	
										Total Duration		**120**	
EA-6B	J52	Test	Out-of-frame	Test Cell Building 873	360	TEST CELL	80	70%	30%	MIL	100% RPM	150	1
										86%	80% RPM	75	
										Idle	70% RPM	75	
										Total Duration		**300**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	80	70%	30%	MIL	92% RPM	150	1
										86%	80% RPM	75	
										Idle	68% RPM	75	
										Total Duration		**300**	
				Hush House Building 777	360	F100-PW-100 in a Hush House	48	100%	0%	MIL	92% RPM	45	1
										86%	80% RPM	23	
										Idle	68% RPM	23	
										Total Duration		**90**	
P-3C (2)	T56-A-14	Test	Out-of-frame	Test Stand Building 201	270	P-3C in frame	12	100%	0%	Idle	120 ESHP	**80**	1
										482 ESHP	482 ESHP	**0**	
										MIL	4600 ESHP	**0**	
										Total Duration		**120**	
P-8A (3)	CFM56	Leak Check	Out-of-frame	Test Cell Building 873	360	TEST CELL	49	75%	25%	20% N1 (5400 Lbs)	70% RPM	5	1
		Pressure Check				TEST CELL	24	75%	25%	20% N1 (5400 Lbs)	70% RPM	12	1

Notes:
1) Events take place 365 days per year for modeling
2) P-3 ops from WR07-22 and scaled by numbers of flight operations
3) P-8 ops scaled down from Alternative 1 by ratio of flight operations

2.3.4 Alternative 2 Noise Exposure

Utilizing the data described in Sections 2.3.1 through 2.3.3, NMAP and RNM were used to calculate and plot the 65 dB through 85 dB DNL contours in increments of 5 dB for average daily aircraft events as shown in Figure 2-8. Similar to Baseline, the 65 dB contour would extend approximately 2.5 miles east and 2.5 miles west of Runway 09/27 primarily due to transient military tactical jet (FA-18E/F) arrivals and FA-18E/F GCA pattern arrivals, respectively. The 65 dB contour would extend about 1 mile to the south and approximately 0.75 miles to the north of Runway 09/27 due to FA-18E/F departures, respectively. Although the FA-18E/F would only account for 2 percent of the overall flight operations it is 5 to 20 dB greater in SEL than other aircraft at NAS Jacksonville so the FA-18E/F would remain the dominant source for DNL.

The 65 dB and 75 dB DNL contours for Alternative 2 are compared to Baseline in Figure 2-9. The 65 dB DNL contour length to both the east and west would not change more than 20 feet because the effects of the P-3 and P-8A operational changes would be dominated by the FA-18E/F operations. The small lobe to the south, west of the station, would reduce in length by approximately 500 feet due to the reduction in T&G pattern events by the P-3 for Alternative 2. Although additional P-8A T&G operations would occur for Alternative 2, most of the additional operations would be during the DNL daytime and have minimal effect. The 75 dB DNL for Alternative 2 would be similar to Baseline.

The total DNL at each of five POI was computed and is listed in Table 2-15. Both Ortega Hills Drive and Ortega Farms Boulevard would experience the highest DNL of 60 dB. The remaining three locations would be exposed to 55 dB DNL or less. DNL at all POI would not change except at Bolles HS which would increase by 1 dB to 55 dB DNL due to the additional P-8A T&G pattern operations.

Table 2-15. DNL at NAS Jacksonville POI for Alternative 2

Point of Interest		DNL (dB)	Increase re Baseline (dB)
ID	Description		
R01	Ortega Hills Drive	60	-
R02	Collins Road	47	-
R03	Timuquana Park	55	-
R04	Ortega Farms Boulevard	60	-

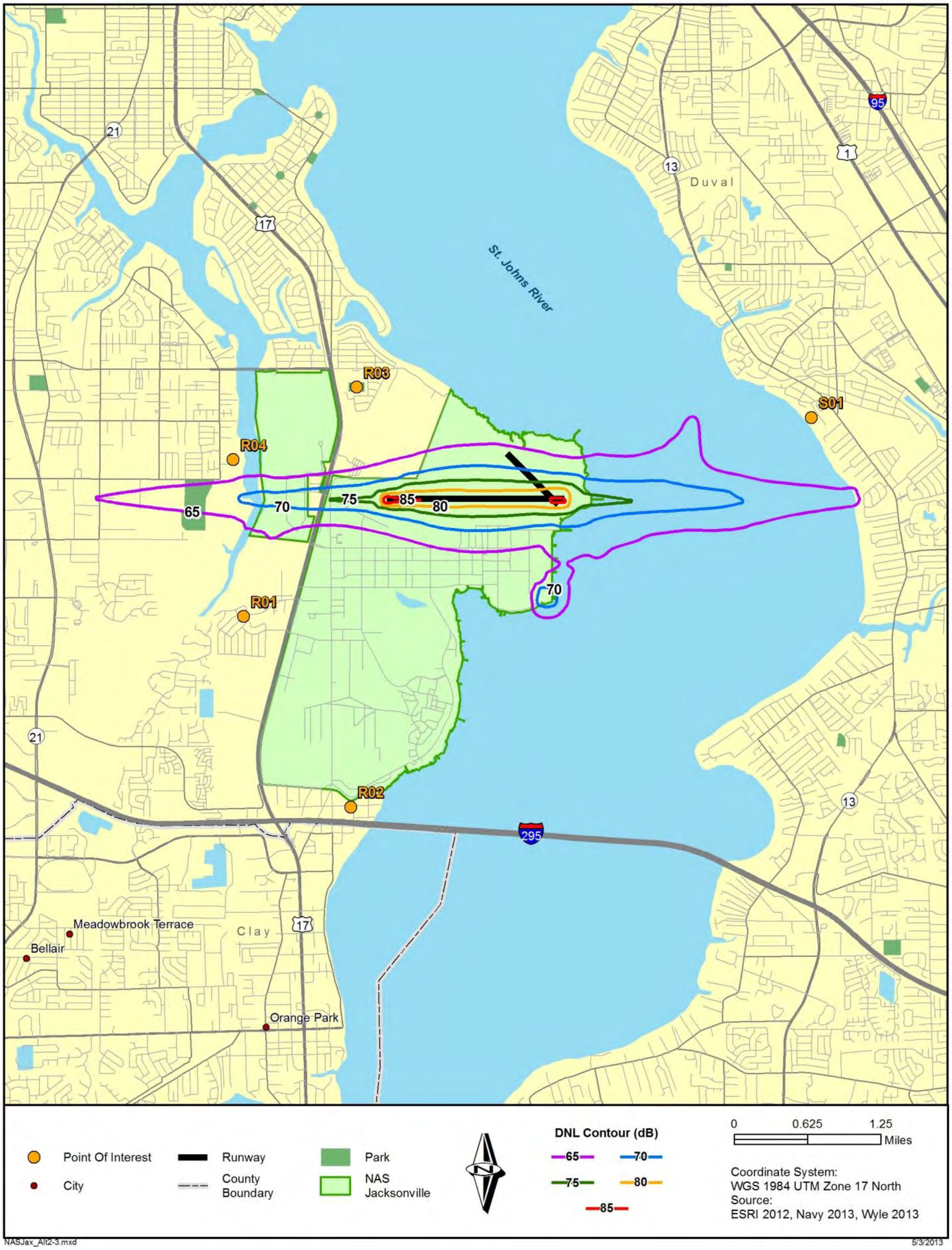

Figure 2-8. DNL Contours for Average Daily Aircraft Operations at NAS Jacksonville for Alternative 2

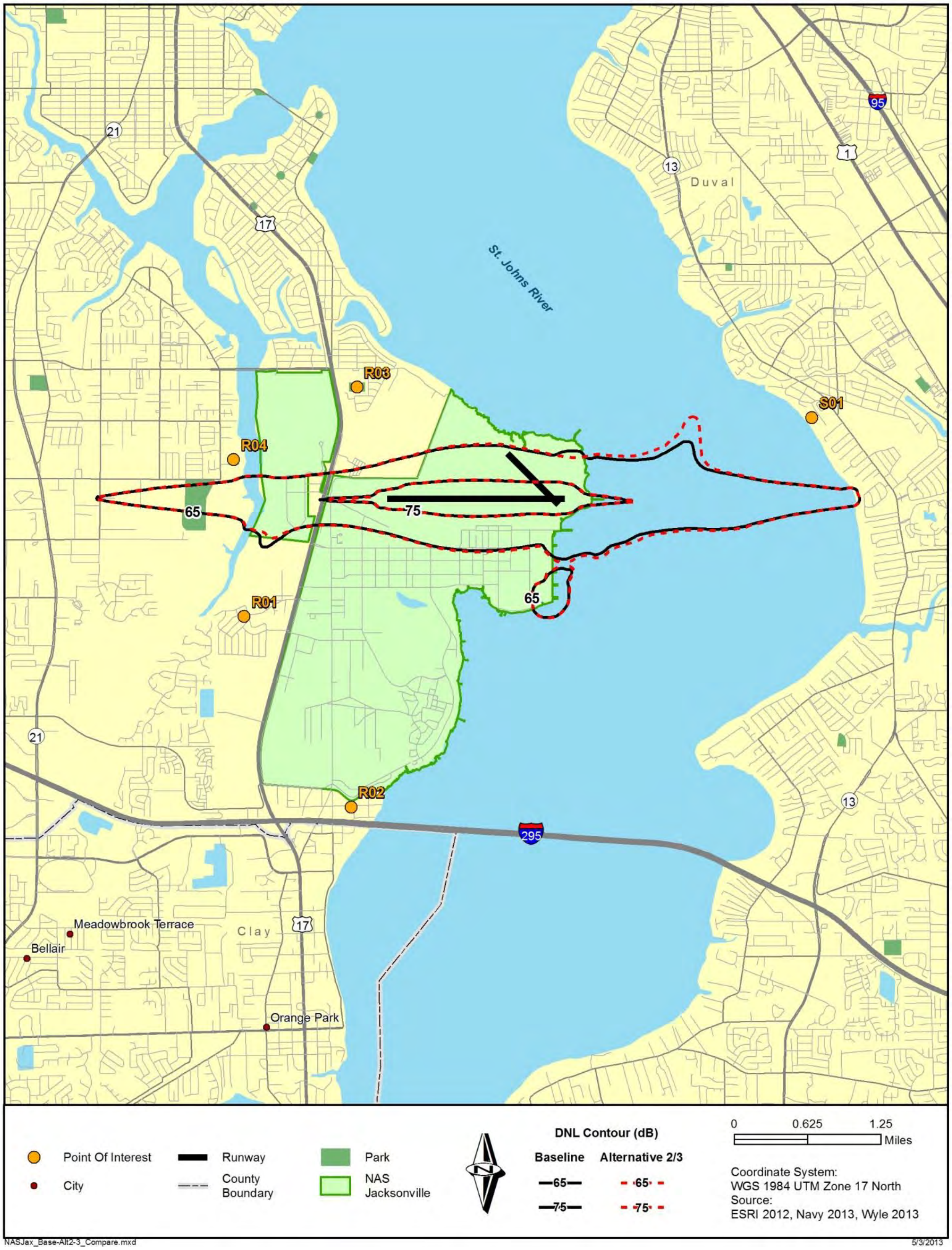

Figure 2-9. Comparison of Select DNL Contours at NAS Jacksonville for Baseline and Alternative 2

The aircraft operations were further analyzed to determine their relative effect on the overall DNL at the five POI. Figure 2-10 depicts the P-3C, P-8A, FA-18E/F, and Other aircraft's DNL contributions. At both Ortega Hills and Collins Road the P-8A would account for the largest portion of the DNL with 59 dB of the total 60 dB and 46 dB of the total 47 dB, respectively. This slight increase of 2 dB of in the P-8A contribution would have less than a 1 dB effect on total DNL at these locations. The increase in the P-8A contribution at Bolles HS would be approximately 3 dB greater than Baseline increasing the total DNL by 1 dB. The FA-18E/F would remain dominant as either the highest or second highest contributor to DNL at all five POI.

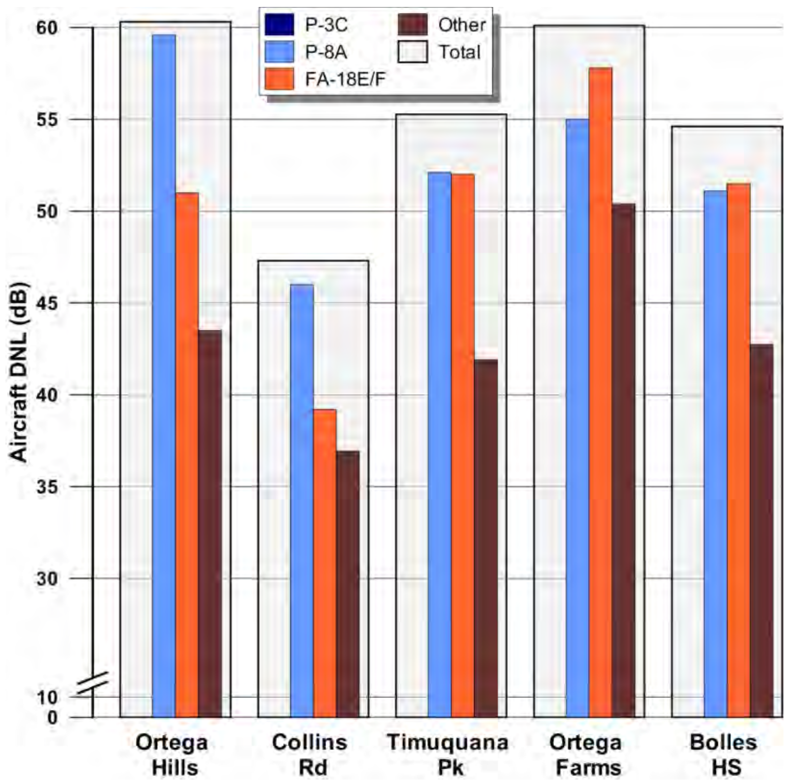

Figure 2-10. DNL Contributors at NAS Jacksonville POI for Alternative 2

2.3.4.1 Potential for Sleep Disturbance

Table 2-16 presents the results of the sleep disturbance analysis for the five POI. For Alternative 2, the PA would range from 2 percent to 6 percent with windows open and ranges from 1 percent to 4 percent with windows closed. The P-8A T&G pattern operations would remain the primary contributor to the PA at all POI. However, the removal of P-3 T&G operations, which included a higher percentage of nighttime events, would cause a net reduction of up to two percent in PA at four of the five POI.

Table 2-16. Average Nightly (2200-0700) Probability of Awakening for NAS Jacksonville POI for Alternative 2

Point of Interest		Alternative 2		Increase Re Baseline	
ID	Description	Windows Open	Windows Closed	Windows Open	Windows Closed
R01	Ortega Hills Drive	5%	2%	-1%	-1%
R02	Collins Road	2%	1%	-1%	-
R03	Timuquana Park	5%	2%	-1%	-
R04	Ortega Farms Boulevard	6%	4%	-2%	-1%
S01	Bolles High School	4%	3%	-	-

*NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

2.3.4.2 Potential for Indoor Speech Interference

Table 2-17 present the results of the speech interference analysis for Alternative 2 for the five POI. Three of the five sites would have more than one speech interfering event per daytime hour for windows open with the maximum of two events per hour occurring at Ortega Farms Boulevard. Only Ortega Farms Boulevard would have more than one speech interfering event per daytime hour for the windows closed conditions. The P-8A T&G pattern operations would account for the majority of the speech interfering events at all POI. The overall trend would be a small reduction in speech interfering events for the windows open condition due to the lower number of P-8A T&G pattern operations in Alternative 2. However, the P-8A is 5 to 10 dB greater in SEL than the P-3 it is replacing which would cause some additional P-8A pattern events to exceed the windows closed condition at Ortega Farms Boulevard that had not for the P-3.

Table 2-17. Potential for Average Daily Indoor Speech Interference NAS Jacksonville POI for Alternative 2

Point of Interest		Indoor Number of Events per Daytime Hour*			
		Alternative 2		Increase Re Baseline	
ID	Description	Windows Open	Windows Closed	Windows Open	Windows Closed
R01	Ortega Hills Dr	1	1	-1	-
R02	Collins Road	1	0	-	-
R03	Timuquana Park	2	1	-	-
R04	Ortega Farms Boulevard	2	2	-1	+1
S01	Bolles School	2	1	-	-
Number of Sites Exceeding 1 Intrusive Event per Hour		3	1	-1	+1
Minimum Number of Intrusive Events per Hour if Exceeding 1		2	2	-	+2
Maximum Number of Intrusive Events per Hour if Exceeding 1		2	2	-1	+2

* Number of Annual Average Daily DNL Daytime Events At or Above an Indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

2.3.4.3 Potential for Classroom Learning Interference

Table 2-18 contains the results of the classroom learning interference analysis for Bolles HS. Aircraft noise at Bolles HS would exceed the indoor $L_{eq(8h)}$ threshold of 35 dB for continuous noise by 5 dB with windows open, primarily due to the FA-18E/F arrival operations to Runway 28. The majority of speech interfering events would be due to the P-8A T&G patterns and the P-3 departures from Runway 10. The $L_{eq(8h)}$ criteria would not be exceeded with windows closed. The interfering events would be 2 and 1 for windows open and windows closed, respectively. There would be no change in either $L_{eq(8h)}$ or numbers of interfering events for Alternative 2 relative to Baseline

Table 2-18. Potential for Average Daily Indoor Classroom Learning Interference for NAS Jacksonville School POI for Alternative 2

School Point Of Interest		Alternative 2					Increase re Baseline				
			Indoor					Indoor			
			Windows Open		Windows Closed			Windows Open		Windows Closed	
ID	Description	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)
S01	Bolles High School	55	40	2	30	1	0	0	0	0	0

(1) Number of annual average busy day events per hour during 8 hour school day (8am-4pm) at or above an indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

2.3.4.4 Potential Hearing Loss

With off-station exposure less than 80 dB DNL, off-station people would have a small (negligible) risk of PHL from aircraft noise for Alternative 2.

SECTION 3

NAS Whidbey Island

Section 3.1 discusses the existing conditions at NAS Whidbey Island for the Baseline year (CY2014). Sections 3.2 and 3.3 explain the results for Alternatives 1 and 2, respectively, for CY2020.

3.1 Baseline Scenario at NAS Whidbey Island

The following subsections describe the modeled flight operations (3.1.1), runway and flight track utilization and modeled flight profiles (3.1.2), pre-flight and maintenance run-up operations (3.1.3), Baseline noise exposure and the supplemental analyses (3.1.4).

3.1.1 Flight Operations

Table 3-1 shows the annual flight operations for the modeled Baseline scenario. Annual flight operations total 68,668 at Ault Field with approximately 13 percent during the DNL nighttime period (2200-0700). Approximately 70, 29, and 1 percent of Baseline flight operations are by the EA-18G Growler, P-3C, and C-9A Skytrain aircraft, respectively. The FA-18E/F Super Hornet is the surrogate for the EA-18G because noise data specifically for the EA-18G does not exist in NOISEMAP's database and because the EA-18G and FA-18E/F share the same engine and airframe. In addition to the 3 fleet squadrons, the P-3C operations include EP-3 reconnaissance aircraft and C-12 King Air twin turboprop operations. The C-9A aircraft is the surrogate for NASMOD's "Transient Jet Large" category. Approximately 62 percent of the modeled flight operations in the vicinity of the NAS are patterns [T&G, Field Carrier Landing Practice (FCLP), Depart and Re-enter, and GCA].

Operations for OLF Coupeville are not shown as the OLF is not relevant to the P-8A action; P-8A would not conduct operations at the OLF.

Average daily events were entered into the noise models, i.e., annual flight operations divided by 365 with pattern operations divided further by 2.

3.1.2 Runway/ Flight Track Utilization and Modeled Flight Profiles

The runway and flight track utilization for this study was updated to correspond to the NASMOD study. See appendix for detailed tables. All modeled flight tracks and flight profiles remain unchanged relative to WR 10-22. See Appendix A of WR 10-22 for maps of representative flight profiles.

3.1.3 Pre-flight and Maintenance Run-up Operations

Consistent with WR 10-22, only the C-9A was modeled with a pre-flight run-up at a power setting of 2 Engine Pressure Ratio (EPR) for 5 seconds prior to each departure's brake release at the start of takeoff roll.

Maintenance run-ups were modeled at the same locations and numbers of events as the Proposed scenario of WR 10-22 as listed in Table 3-2 and depicted in Figure 3-1.

Table 3-1. Annual Flight Operations at NAS Whidbey Island for Baseline Scenario

Modeled Aircraft Type	Note	Visual Departure			Instrument Departure (Low TACAN)			Interfacility Departure to Coupeville		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3, 4	8,737	1,064	9,801	-	-	-	105	36	141
P-3C	5, 6	1,381	108	1,489	1,265	123	1,388	-	-	-
P-8A	5	-	-	-	-	-	-	-	-	-
B737-700	5	-	-	-	-	-	-	-	-	-
C-9A	7	342	95	437	-	-	-	-	-	-
TOTAL		**10,460**	**1,267**	**11,727**	**1,265**	**123**	**1,388**	**105**	**36**	**141**

Modeled Aircraft Type	Note	Visual Full Stop Arrival (1)			Overhead Break Arrival			Instrument Full Stop Arrival			TACAN Arrival			Interfacility Arrival from Coupeville (with Break)		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3, 4	3,441	181	3,622	4,859	888	5,747	-	-	-	400	28	428	87	54	141
P-3C	5, 6	2,483	172	2,655	-	-	-	111	5	116	102	5	107	-	-	-
P-8A	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B737-700	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-9A	7	337	79	416	-	-	-	15	6	21	-	-	-	-	-	-
TOTAL		**6,261**	**432**	**6,693**	**4,859**	**888**	**5,747**	**126**	**11**	**137**	**502**	**33**	**535**	**87**	**54**	**141**

Modeled Aircraft Type	Note	Touch and Go (2)			FCLP (2)			Depart & Reenter Pattern (2)			GCA Box (2)			TOTAL		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3, 4	6,134	136	6,270	10,864	6,111	16,975	1,626	36	1,662	5,344	446	5,790	41,597	8,980	50,577
P-3C	5, 6	8,528	444	8,972	-	-	-	-	-	-	5,112	178	5,290	18,982	1,034	20,016
P-8A	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B737-700	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-9A	7	-	-	-	-	-	-	-	-	-	-	-	-	694	180	874
TOTAL		**14,662**	**580**	**15,242**	**10,864**	**6,111**	**16,975**	**1,626**	**36**	**1,662**	**10,456**	**624**	**11,080**	**61,273**	**10,194**	**71,467**

Source: NASMOD Calibrated Baseline for P-3, P-8 and B737-700; NASMOD Alt 2 for FA-18E/F and C-9A (except where noted).

Notes:
1) Includes NASMOD's "Re-Enter Full Stop" operations in order to initially balance arrivals and departures.
2) Each circuit counted as 2 operations.
3) represents EA-18G aircraft.
4) from Alt 2 except FA-18E/F FCLP; FCLP ops from 2012 EA but w ith 64%/36% day/night split from Alt 2.
5) from NASMOD Calibrated Baseline.
6) includes C-12 operations, EP-3 reconnaissance operations, P-3 fleet and Reserve operations.
7) represents NASMOD "Transient Jet Large" category; Instrument Full Stop Arrivals modeled as Visual Full Stop.

Table 3-2. Maintenance Run-up Operations at NAS Whidbey Island for Baseline Scenario

Aircraft Type	Engine Type	Run-up Type	In-frame / Out-of-frame	Pad ID	Magnetic Heading (degrees)	Modeled Aircraft Type (if different)	Annual Events	Percent Day (0700 - 2200)	Percent Night (2200 - 0700)	Reported Power Setting	Modeled Power Setting (if different)	Duration (Minutes) Per Event	No. of Engines Running Each Event
EA-18G	F414-GE-400	Water Wash	In-frame	Lo-Pwr (1)	045	FA-18E/F	195	45%	55%	Ground Idle	65% NC	20	1
		Low power	In-frame	Lo-Pwr (1)	045	FA-18E/F	3440	45%	55%	Ground Idle	65% NC	15	1
										80%NC		15	1
		High Power	In-frame	Hi-Pwr (Primary)	315	FA-18E/F	18	100%	0%	Ground Idle	65% NC	10	1
										80%NC		10	1
										90%NC		10	1
										Mil	96% NC	10	1
										AB	Min AB	3	1
P-3C	T56-A-14	Lo-Pwr	In-frame	Lo-Pwr	126		1604	100%	0%	1000 ESHP	1000 ESHP	15	1
		Out-Of-Phase	In-frame	Lo-Pwr	126		130			250 ESHP	250 ESHP	30	4
										450 ESHP	450 ESHP	10	4
										1000 ESHP	1000 ESHP	10	4
		Prop Dynamic Balance	In-frame	Lo-Pwr	126		123			1500 ESHP	1500 ESHP	15	1
		High-PowerD	In-frame	Red Label Delta	315		154			1500 ESHP	1500 ESHP	15	2
										2750 ESHP	2750 ESHP	15	2
										4300 ESHP	4300 ESHP	10	2
		High-PowerF	In-frame	Red Label Foxtrot	342		154			1500 ESHP	1500 ESHP	15	2
										2750 ESHP	2750 ESHP	15	2
										4300 ESHP	4300 ESHP	10	2
		Prop Dynamic Balancing	In-frame	Hi-Pwr	315		123			1500 ESHP	1500 ESHP	15	1

Notes: (1) Run-up events split equally between three Lo-Pwr run-up locations
(2) EA-6B and EA-18G run-up events from WR10-22 Baseline Scenario
(3) P-3 events scaled down by numbers of flight operations from Baseline

Figure 3-1. Maintenance Run-up Locations at NAS Whidbey Island

3.1.4 Baseline Noise Exposure

Utilizing the data described in Sections 3.1.1 through 3.1.3, NMAP was used to calculate and plot the 65 dB through 85 dB DNL contours in increments of 5 dB for average daily aircraft events as shown in Figure 3-2. The 65 dB DNL contour extends nearly to the eastern shore of the mainland across Skagit Bay, which is the location where aircraft flying GCA approaches pass through 1000 feet AGL. The 65 dB DNL contour otherwise extends over land approximately 3 to 4 miles from the center of the airfield, the result of overlapping T&G and FCLP flight tracks and operations. The 80 dB DNL contours extend off-station to the south and to the east tracing pattern tracks. The 80 dB DNL contour extends off-station to the north by approximately 0.5 miles. The 85 dB DNL contours extends off-station by nearly 1 mile to the east and nearly 0.2 mile to the north. The easterly extensions of these contours are primarily due to the arrival portion of EA-18G T&G patterns on Runway 25.

The total DNL at each of six POI was computed and is listed in Table 3-3. The greatest DNL of 75 dB occurs at Clover Valley Day School due to the EA-18G FCLP patterns on Runway 25. The second greatest DNL of 70 dB occurs at Deception Pass State Park due primarily to EA-18G break arrivals to Runway 14 during the DNL nighttime. Olympic View Elementary School has a DNL of 65 dB primarily due to Growler Depart and Reenter patterns to Runway 07. The remaining three locations are exposed to DNL less than 65 dB.

Table 3-3. DNL at NAS Whidbey Island POI for Baseline Scenario

Point of Interest		DNL (dB)
ID	Description	
P1	City Beach Park	56
P2	Olympic View Elementary School	65
P3	Deception Pass State Park	70
P4	La Conner Middle School	47
P5	Picnic Point	47
P6	Clover Valley Day School	75

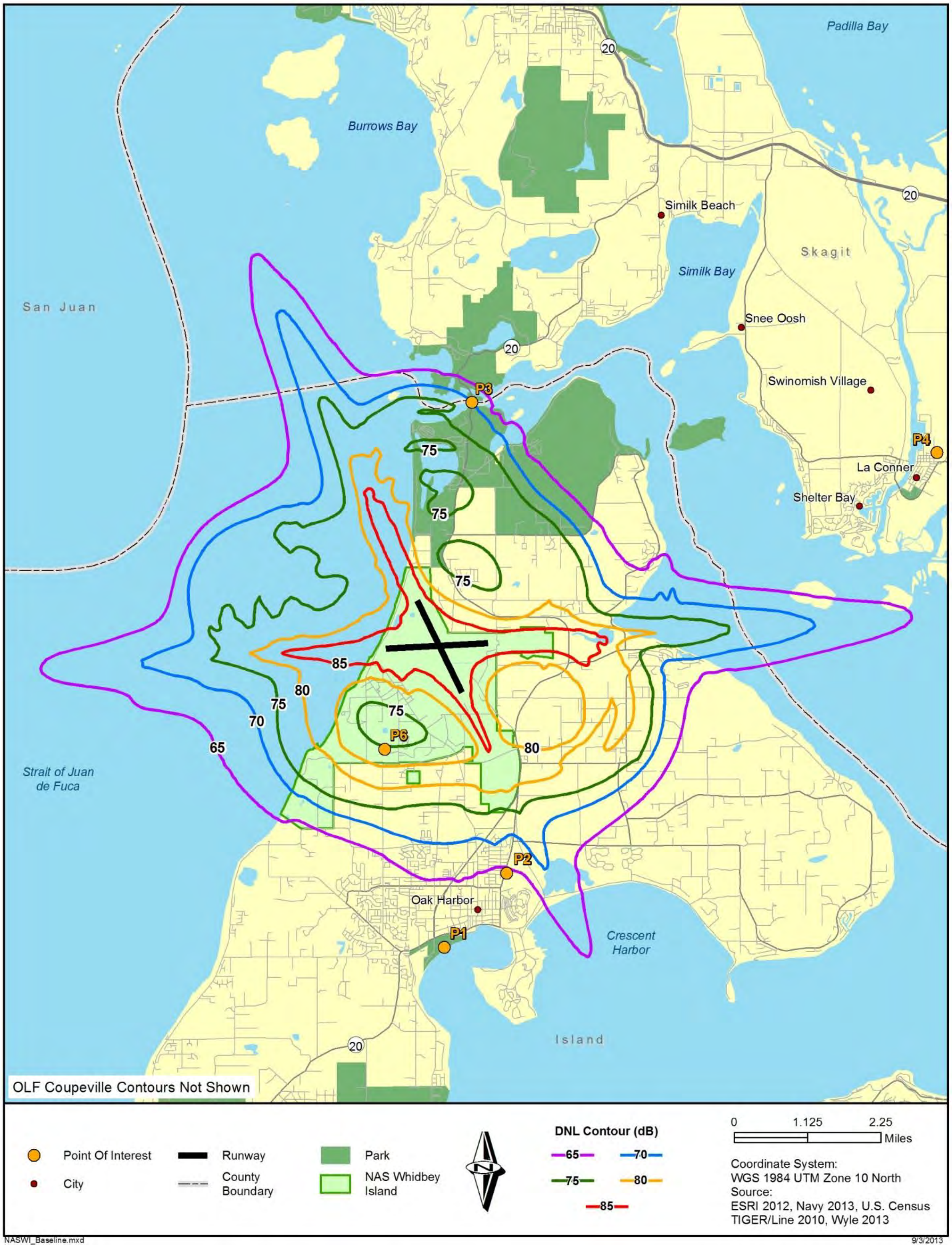

Figure 3-2. DNL Contours for Average Daily Aircraft Operations at NAS Whidbey Island for Baseline Scenario

The Baseline aircraft operations were further analyzed to determine their relative effect on the overall DNL at the six POI. Figure 3-3 depicts the P-3C, P-8A, FA-18E/F, and Other (C-9A and transient C-40) aircraft DNL contributions. At all locations the EA-18G (listed by the surrogate FA-18E/F) is the dominant contributor. The EA-18G's DNL component is 20 to 30 dB greater than any of the other aircraft types. This is due to the EA-18G owning most of the total flight operations (70 percent) and the SEL of the EA-18G being 8 to 20 dB greater than the other aircraft modeled at NASWI.

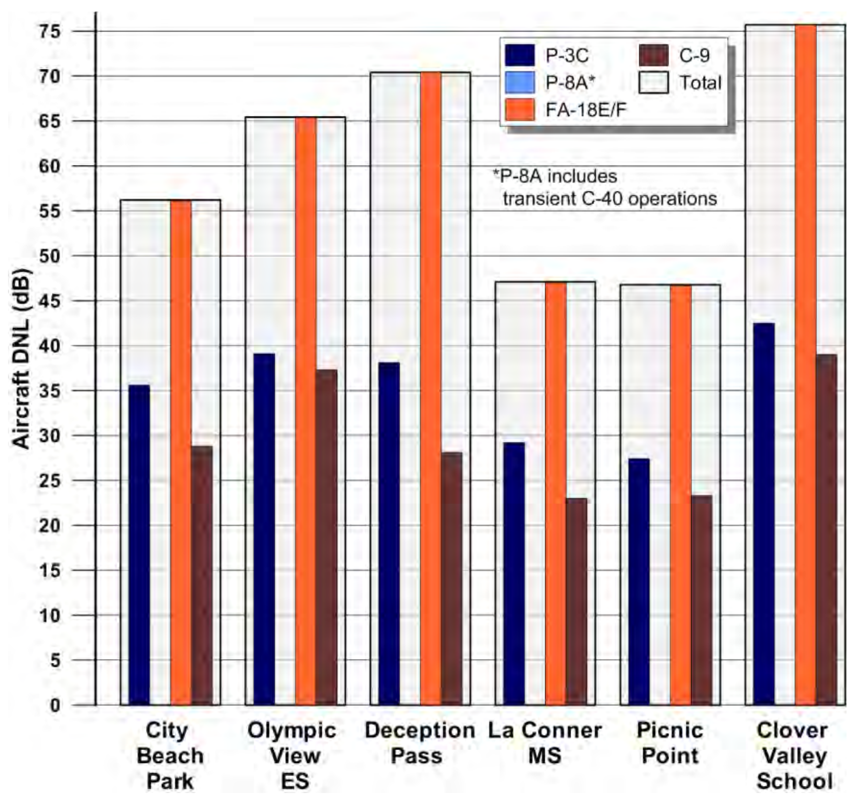

Figure 3-3. DNL Contributors at NAS Whidbey Island POI for Baseline Scenario

3.1.4.1 Potential for Sleep Disturbance

Table 3-4 presents the results of the sleep disturbance analysis for the six POI. For Baseline, the PA ranges from 5 percent to 47 percent with windows open and ranges from 1 percent to 33 percent with windows closed. The EA-18G T&G pattern operations on Runways 25 and 14 are the primary contributor to the PA at all POI.

Table 3-4. Average Nightly (2200-0700) Probability of Awakening for NAS Whidbey Island POI for Baseline Scenario

Point of Interest		Windows	Windows
ID	Description	Open	Closed
P1	City Beach Park	24%	13%
P2	Olympic View Elementary School	32%	21%
P3	Deception Pass State Park	30%	16%
P4	La Conner Middle School	6%	1%
P5	Picnic Point	5%	1%
P6	Clover Valley Day School	47%	33%

*NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

3.1.4.2 Potential for Indoor Speech Interference

Table 3-5 present the results of the speech interference analysis for the Baseline scenario for the six POI. For the Baseline scenario, four of the six sites have more than one speech interfering event per daytime hour for windows open with the maximum of six events per hour occurring at the Clover Valley Day School area which also has four interfering events for the windows closed conditions. None of the other POI have more than one speech interfering event per daytime hour for the windows closed condition.

The EA-18G departures account for the majority of speech interfering events at the City Beach Park, Olympic View Elementary School, Deception Pass State Park and Clover Valley Day School areas. The EA-18G GCA patterns are the primary cause for interfering events at the La Conner Middle School and Picnic Points areas.

Table 3-5. Potential for Average Daily Indoor Speech Interference NAS Whidbey Island POI for Baseline Scenario

Point of Interest		Indoor Number of Events per Daytime Hour*	
ID	Description	Windows Open	Windows Closed
P1	City Beach Park	2	0
P2	Olympic View Elementary School	4	1
P3	Deception Pass State Park	4	1
P4	La Conner Middle School	1	0
P5	Picnic Point	0	0
P6	Clover Valley Day School	6	4
Number of Sites Exceeding 1 Intrusive Event per Hour		4	1
Minimum Number of Intrusive Events per Hour if Exceeding 1		2	4
Maximum Number of Intrusive Events per Hour if Exceeding 1		6	4

* Number of Annual Average Daily DNL Daytime Events At or Above an Indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for w indow s open and closed, respectively

3.1.4.3 Potential for Classroom Learning Interference

Table 3-6 contains the results of the classroom learning interference analysis for Olympic View Elementary, La Conner Middle School, and Clover Valley Day School. For the Baseline scenario, aircraft noise at Olympic View exceeds the indoor $L_{eq(8h)}$ threshold of 35 dB for continuous noise by 16 dB with windows open and 6 dB for windows closed. Speech interfering events are 5 and 2 per hour for windows open and windows closed, respectively. The EA-18G Depart and Re-enter patterns are the primary cause for the $L_{eq(8h)}$ because the flight path is less than a quarter mile from the school. The speech interfering events are primarily due to the EA-18G departures.

La Conner Middle School does not exceed the $L_{eq(8h)}$ threshold of 35 dB. This school experiences 1 interfering event per hour for the windows open condition only.

Clover Valley Day School exceeds the indoor $L_{eq(8h)}$ threshold of 35 dB for continuous noise by 22 dB with windows open and 12 dB for windows closed. Speech interfering events are 5 and 7 per hour for windows open and windows closed, respectively. The EA-18G Touch and Go patterns are the primary cause for the $L_{eq(8h)}$ because the flight path is approximately a quarter mile from the school. The speech interfering events are primarily due to the EA-18G departures.

Table 3-6. Potential for Average Daily Indoor Classroom Learning Interference for NAS Whidbey Island School POI for Baseline Scenario

School Point Of Interest		Outdoor	Indoor			
			Windows Open		Windows Closed	
ID	Description	$L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)
P2	Olympic View Elementary School	66	51	5	41	2
P4	La Conner Middle School	47	32	1	22	-
P6	Clover Valley Day School	72	57	7	47	5
Number of Sites Exceeding 1 Intrusive Event per Hour				2		2
Minimum Number of Intrusive Events per Hour if Exceeding 1				5		2
Maximum Number of Intrusive Events per Hour if Exceeding 1				7		5

* Number of annual average busy day events per hour during 8 hour school day (8am-4pm) at or above an indoor Maximum (single-event) Sound Level (Lmax) of 50 dB;
NLRs of 15 dB and 25 dB for w indow s open and closed, respectively

3.1.4.4 Potential Hearing Loss

Table 3-7 lists the estimated off-station population and their associated levels of NIPTS for the Baseline scenario. Up to 14 people with average sensitivity have lifetime NIPTS of at least 5 dB. For the 10 percent of people with the highest sensitivity, there may be up to 255 people with a lifetime NIPTS of at least 5 dB due to NASWI aircraft noise.

Table 3-7. Off-station Population with Potential Hearing Loss Due to Aircraft Operations at NAS Whidbey Island for Baseline Scenario

$L_{eq(24h)}$ Band	Avg NIPTS (dB) (1)	10th percentile NIPTS (dB) (1)	Baseline Population
71-72	0.0	2.5	1
72-73	0.0	3.0	30
73-74	0.5	3.0	104
74-75	0.5	3.5	341
75-76	1.0	4.0	155
76-77	1.0	4.5	99
77-78	1.6	5.0	84
78-79	2.0	5.5	42
79-80	2.5	6.0	31
80-81	3.0	7.0	23
81-82	3.5	8.0	17
82-83	4.0	9.0	12
83-84	4.5	10.0	9
84-85	5.5	11.0	6
85-86	6.0	12.0	4
86-87	7.0	13.5	3
87-88	7.5	15.0	1
88-89	8.5	16.5	0

NIPTS (dB)	Avg Population	10th percentile Population
< 5 dB (2)	**948**	**730**
5 - 10 dB (3)	**14**	**232**
>= 10 dB	**0**	**23**
Total >= 5 (3)	**14**	**255**

Notes: (1) NIPTS values rounded to nearest 0.5 dB
(2) sum of population less than 84 dB L_{eq24} for Avg Population
(3) sum of population greater than or equal to 84-85 dB L_{eq24} band for Avg Population

3.2 Alternative 1 at NAS Whidbey Island

Alternative 1 includes 6 fleet squadrons of P-8A aircraft. The P-3C aircraft would retire. The following subsections describe the modeled flight operations (3.2.1), runway and flight track utilization and modeled flight profiles (3.2.2), pre-flight and maintenance run-up operations (3.2.3), Alternative 1 noise exposure and the supplemental analyses (3.2.4).

3.2.1 Flight Operations

Table 3-8 shows the annual flight operations for the modeled Alternative 1 scenario. Annual flight operations would total 61,735 at Ault Field with approximately 15 percent during the DNL nighttime period (2200-0700). Approximately 77 and 17 percent of Alternative 1 flight operations would be by the EA-18G (FA-18E/F) and P-8A, respectively. The P-3C operations in Table 3-8 are surrogates for C-12 King Air twin turboprop aircraft operations. The EP-3 operations from Baseline would be retired. Identical to Baseline, the C-9A aircraft serves as a surrogate for NASMOD's "Transient Jet Large" category. Approximately 57 percent of the modeled flight operations in the vicinity of the NAS would be patterns (T&G, FCLP, Depart and Re-enter, and GCA).

Average daily events were entered into the noise models, i.e., annual flight operations divided by 365 with pattern operations divided further by 2.

Table 3-8. Annual Flight Operations at NAS Whidbey Island for Alternative 1

Modeled Aircraft Type	Note	Visual Departure			Instrument Departure (Low TACAN)			Interfacility Departure to Coupeville		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3	8,737	1,064	9,801	-	-	-	105	36	141
P-3C	4	258	-	258	-	-	-	-	-	-
P-8A	5	913	41	954	1,029	48	1,077	-	-	-
B737-700	6	697	-	697	-	-	-	-	-	-
C-9A	7	342	95	437	-	-	-	-	-	-
TOTAL		**10,947**	**1,200**	**12,147**	**1,029**	**48**	**1,077**	**105**	**36**	**141**

Modeled Aircraft Type	Note	Visual Full Stop Arrival (1)			Overhead Break Arrival			Instrument Full Stop Arrival			TACAN Arrival			Interfacility Arrival from Coupeville (with Break)		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3	3,441	181	3,622	4,859	888	5,747	-	-	-	400	28	428	87	54	141
P-3C	4	240	-	240	-	-	-	18	-	18	-	-	-	-	-	-
P-8A	5	1,613	311	1,924	-	-	-	48	6	54	48	6	54	-	-	-
B737-700	6	662	-	662	-	-	-	38	-	38	-	-	-	-	-	-
C-9A	7	337	79	416	-	-	-	15	6	21	-	-	-	-	-	-
TOTAL		**6,293**	**571**	**6,864**	**4,859**	**888**	**5,747**	**119**	**12**	**131**	**448**	**34**	**482**	**87**	**54**	**141**

Modeled Aircraft Type	Note	Touch and Go (2)			FCLP (2)			Depart & Reenter Pattern (2)			GCA Box (2)			TOTAL		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3	6,134	136	6,270	10,864	6,111	16,975	1,626	36	1,662	5,344	446	5,790	41,597	8,980	50,577
P-3C	4	-	-	-	-	-	-	-	-	-	-	-	-	516	-	516
P-8A	5	3,404	436	3,840	-	-	-	-	-	-	2,154	234	2,388	9,209	1,081	10,290
B737-700	6	292	-	292	-	-	-	-	-	-	588	-	588	2,277	-	2,277
C-9A	7	-	-	-	-	-	-	-	-	-	-	-	-	694	180	874
TOTAL		**9,830**	**572**	**10,402**	**10,864**	**6,111**	**16,975**	**1,626**	**36**	**1,662**	**8,086**	**680**	**8,766**	**54,293**	**10,241**	**64,534**

Source: NASMOD Alt 2 except P-8 and where noted; P-8 from NASMOD Alt 1

Notes:

1) Includes NASMOD's "Re-Enter Full Stop" operations in order to initially balance arrivals and departures

2) Each circuit counted as 2 operations

3) represents EA-18G aircraft; Per WR 10-22, 80% of non-interfacility departures use Afterburner; 100% of interfacility departures use Mil power. FCLP ops from 2012 EA but with 64%/36% day/night split from Alt 2.

4) includes C-12 operations only.

5) Modeled as B737-700.

6) represents C-40 operations.

7) represents NASMOD "Transient Jet Large" category; Instrument Full Stop Arrivals modeled as Visual Full Stop.

3.2.2 Runway/ Flight Track Utilization and Modeled Flight Profiles

Alternative 1 would utilize the same runway and flight track utilization as Baseline. Flight profiles remain unchanged and the additional P-8A flight profiles are from WR 10-22.

3.2.3 Pre-flight and Maintenance Run-up Operations

No pre-flight run-up was modeled for the P-8A departures. Maintenance run-ups for the P-3 were scaled (down) proportionally to the reduction in flight operations and detailed in Table 3-9. The P-8A run-ups are modeled the same as the Proposed scenario of WR 10-22 except the events were scaled by a ratio of 6/7 because WR 10-22 had assumed the maximum basing of 7 P-8A fleet squadrons.

Table 3-9. Maintenance Run-up Operations at NAS Whidbey Island for Alternative 1

Aircraft Type	Engine Type	Run-up Type	In-frame / Out-of-frame	Pad ID	Magnetic Heading (degrees)	Modeled Aircraft Type (if different)	Annual Events	Percent Day (0700 - 2200)	Percent Night (2200 - 0700)	Reported Power Setting	Modeled Power Setting (if different)	Duration (Minutes) Per Event	No. of Engines Running Each Event
EA-18G	F414-GE-400	Water Wash	In-frame	Lo-Pwr (1)	045	FA-18E/F	195	45%	55%	Ground Idle	65% NC	20	1
		Low power	In-frame	Lo-Pwr (1)	045	FA-18E/F	3440	45%	55%	Ground Idle	65% NC	15	1
										80%NC		15	1
		High Power	In-frame	Hi-Pwr (Primary)	315	FA-18E/F	18	100%	0%	Ground Idle	65% NC	10	1
										80%NC		10	1
										90%NC		10	1
										Mil	96% NC	10	1
										AB	Min AB	3	1
P-8A	CFM56-7B-24	Leak Check	In-frame	P3/P8	126	B737-700	42	75%	25%	20% N1 (5400 Lbs)		5	1
		Pressure Check					21	75%	25%	20% N1 (5400 Lbs)		12	1
		Leak Check	In-frame	Hi-Pwr (Primary)	67	B737-700	42	75%	25%	20% N1 (5400 Lbs)		5	1
		Pressure Check					21	75%	25%	20% N1 (5400 Lbs)		12	1
P-3C	T56-A-14	Lo-Pwr	In-frame	Lo-Pwr	126		26	100%	0%	1000 ESHP	1000 ESHP	15	1
		Out-Of-Phase	In-frame	Lo-Pwr	126		2			250 ESHP	250 ESHP	30	4
										450 ESHP	450 ESHP	10	4
										1000 ESHP	1000 ESHP	10	4
		Prop Dynamic Balance	In-frame	Lo-Pwr	126		2			1500 ESHP	1500 ESHP	15	1
		High-PowerD	In-frame	Red Label Delta	315		2			1500 ESHP	1500 ESHP	15	2
										2750 ESHP	2750 ESHP	15	2
										4300 ESHP	4300 ESHP	10	2
		High-PowerF	In-frame	Red Label Foxtrot	-18		2			1500 ESHP	1500 ESHP	15	2
										2750 ESHP	2750 ESHP	15	2
										4300 ESHP	4300 ESHP	10	2
		Prop Dynamic Balancing	In-frame	Hi-Pwr	315		2			1500 ESHP	1500 ESHP	15	1

Notes: (1) Run-up events split equally between three Lo-Pwr run-up locations
(2) P-8 events scaled from 56 annual Leak Checks and 28 annual Pressure Checks from MMA EIS WR 10-22 Alternative 5 (4 P-8 squadrons)
(3) P-3 events scaled down by numbers of flight operations from Baseline

3.2.4 Alternative 1 Noise Exposure

Utilizing the data described in Sections 3.2.1 through 3.2.3, NMAP was used to calculate and plot the 65 dB through 85 dB DNL contours in increments of 5 dB for average daily aircraft events as shown in Figure 3-4. The 65 dB DNL contour would extend nearly to the eastern shore of the mainland across Skagit Bay, which is the location where aircraft flying GCA approaches would pass through 1000 feet AGL. The 65 dB DNL contour otherwise would extend over land approximately 3 to 4 miles from the center of the airfield, the result of overlapping T&G and FCLP flight tracks and operations. The 80 dB DNL contour would extend off-station to the north by approximately 0.5 miles. The 85 dB DNL contours would extend off-station by nearly 1 mile to the east and nearly 0.2 mile to the north. The easterly extensions of these contours would be primarily due to the arrival portion of EA-18G T&G patterns on Runway 25.

Figure 3-5 shows a comparison of the 65 and 75 dB DNL contours. The Alternative 1 contours are nearly identical to Baseline. This is because the EA-18G is the primary driver of the DNL contours and their operations would not change relative to Baseline. The P-3/P-8A operations are not sufficient in either SEL or numbers of operations to cause a change.

The total DNL at each of six POI was computed and is listed in Table 3-10. The greatest DNL of 76 dB would continue to occur at Clover Valley Day School due to the EA-18G FCLP patterns on Runway 25 while the second greatest of 70 dB at Deception Pass State Park would remain the EA-18G break arrivals to Runway 14 during the DNL nighttime. Olympic View Elementary School would have a DNL of 66 dB due to Growler Depart and Reenter patterns to Runway 07. The DNL at the remaining three locations would be less than 65 dB.

Changes in DNL at each of the POI relative to Baseline would be less than 1 dB except for Olympic View Elementary School. The 1 dB increase at this school would be due to a 0.1 dB contribution of the P-8A introduction/P-3 replacement and mathematical rounding.

Table 3-10. DNL at NAS Whidbey Island POI for Alternative 1

Point of Interest		DNL (dB)	Increase re Baseline (dB)
ID	Description		
P1	City Beach Park	56	-
P2	Olympic View Elementary School	66	+1
P3	Deception Pass State Park	70	-
P4	La Conner Middle School	47	-
P5	Picnic Point	47	-
P6	Clover Valley Day School	76	-

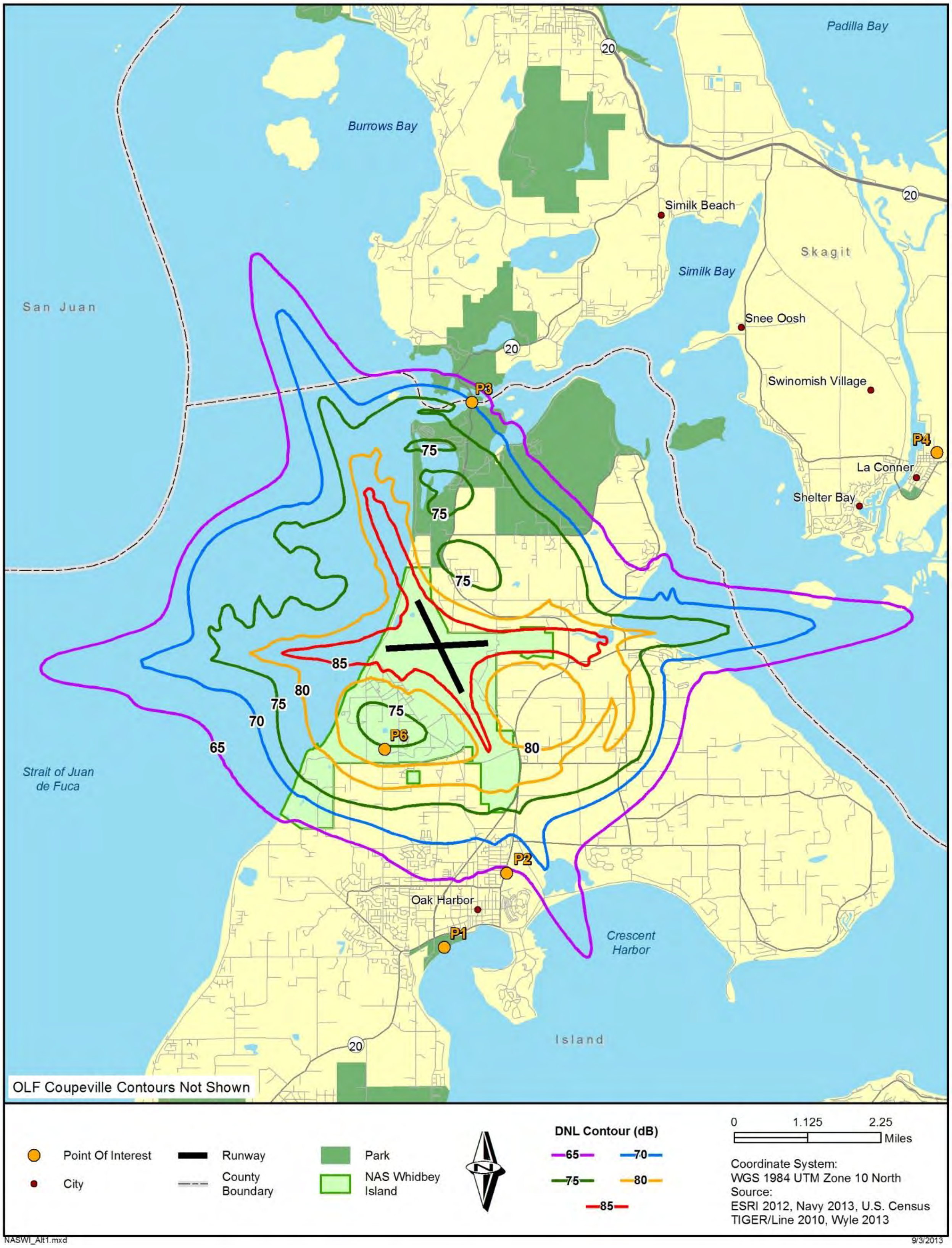

Figure 3-4. DNL Contours for Average Daily Aircraft Operations at NAS Whidbey Island for Alternative 1

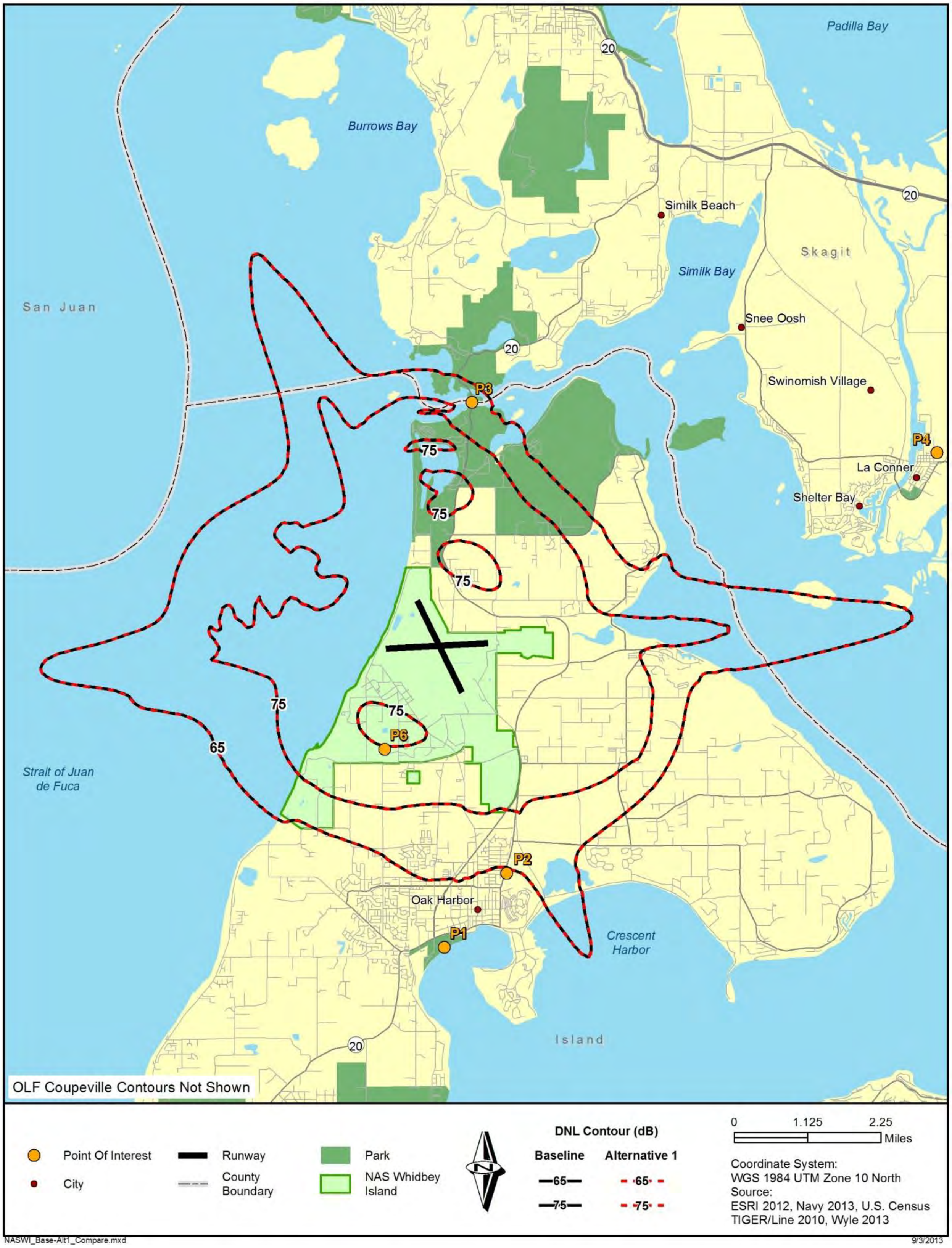

Figure 3-5. Comparison of Select DNL Contours at NAS Whidbey Island for Baseline and Alternative 1 Scenarios

The Alternative 1 aircraft operations were further analyzed to determine their relative effect on the overall DNL at the six POI. Figure 3-6 depicts the P-3C, P-8A, FA-18E/F, and Other (C-9A) aircraft DNL contributions. At all locations the EA-18G (listed by the surrogate FA-18E/F) would be the dominant contributor. The EA-18G's DNL component would be 10 to 23 dB greater than any of the other aircraft types. This would be due to the EA-18G owning most of the total flight operations (77 percent) and the SEL of the EA-18G being 8 to 20 dB greater than the other aircraft modeled at NASWI.

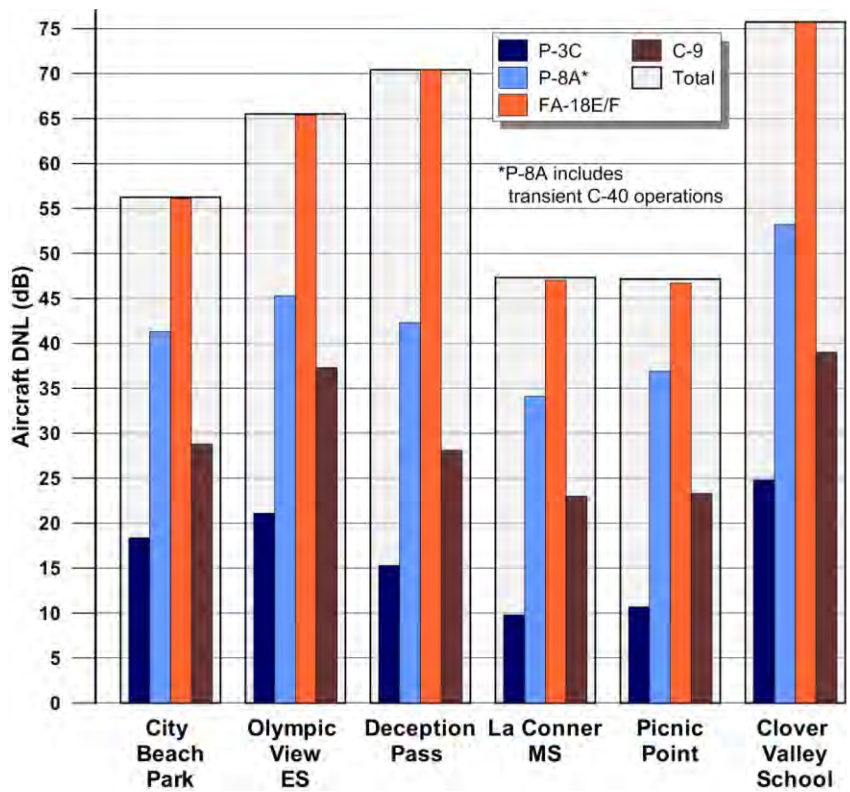

Figure 3-6. DNL Contributors at NAS Whidbey Island POI for Alternative 1

3.2.4.1 Potential for Sleep Disturbance

Table 3-11 presents the results of the sleep disturbance analysis for the six POI. For Alternative 1, the PA would range from 6 percent to 46 percent with windows open and would range from 1 percent to 34 percent with windows closed. The EA-18G T&G pattern operations on Runways 25 and 14 would be the primary contributor to the PA at all POI. A maximum increase of 1 percent in PA would occur at all POI except Olympic View Elementary School and La Conner Middle School. The increase would primarily due to the P-8A T&G pattern operations. Although the P-8A would conduct approximately the same number of T&G operations during DNL nighttime as the P-3 aircraft in Baseline, the P-8A is up to 10 dB greater in SEL than the P-3.

Table 3-11. Average Nightly (2200-0700) Probability of Awakening for NAS Whidbey Island POI for Alternative 1

Point of Interest		Alternative 1		Increase Re Baseline	
ID	Description	Windows Open	Windows Closed	Windows Open	Windows Closed
P1	City Beach Park	25%	13%	+1%	-
P2	Olympic View Elementary School	32%	21%	-	-
P3	Deception Pass State Park	31%	16%	+1%	-
P4	La Conner Middle School	6%	1%	-	-
P5	Picnic Point	6%	1%	+1%	-
P6	Clover Valley Day School	48%	34%	+1%	+1%

*NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

3.2.4.2 Potential for Indoor Speech Interference

Table 3-12 present the results of the speech interference analysis for Alternative 1 for the six POI. Four of the six sites would have more than one speech interfering event per daytime hour for windows open with the maximum of six events per hour occurring at the Clover Valley Day School area. Relative to Baseline, an increase of one event per hour would occur at the Olympic View Elementary School and Clover Valley Day School areas, for the windows closed condition. The increase would be due to the P-8A aircraft. Although the P-8A would have fewer operations than the P-3, the P-8's L_{max} would be greater than that of the P-3. The EA-18G would remain the primary contributor to speech interfering events at all POI.

Table 3-12. Potential for Average Daily Indoor Speech Interference for NAS Whidbey Island POI for Alternative 1

Point of Interest		Indoor Number of Events per Daytime Hour*			
		Alternative 1		Increase Re Baseline	
ID	Description	Windows Open	Windows Closed	Windows Open	Windows Closed
P1	City Beach Park	2	0	-	-
P2	Olympic View Elementary School	4	2	-	+1
P3	Deception Pass State Park	4	1	-	-
P4	La Conner Middle School	1	0	-	-
P5	Picnic Point	0	0	-	-
P6	Clover Valley Day School	6	5	-	+1
Number of Sites Exceeding 1 Intrusive Event per Hour		4	2	-	+1
Minimum Number of Intrusive Events per Hour if Exceeding 1		2	2	-	-2
Maximum Number of Intrusive Events per Hour if Exceeding 1		6	5	-	+1

* Number of Annual Average Daily DNL Daytime Events At or Above an Indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for w indow s open and closed, respectively.

3.2.4.3 Potential for Classroom Learning Interference

Table 3-13 contains the results of the classroom learning interference analysis for Olympic View Elementary, La Conner Middle School, and Clover Valley Day School. For Alternative 1, there would be no change relative to Baseline. Olympic View and Clover Valley Day School would continue to exceed the indoor $L_{eq(8h)}$ threshold of 35 dB for continuous noise by 16 dB and 22 dB, respectively, with windows open and 6 dB and 12 dB, respectively, for windows closed. The EA-18G Depart and Re-enter patterns would remain the primary cause for the $L_{eq(8h)}$ at Olympic View and the EA-18G Touch and Go patterns would continue to be the primary cause for the $L_{eq(8h)}$ at Clover Valley Day School. The EA-18G departures would continue to drive the potentially interfering events at all three school locations.

Table 3-13. Potential for Average Daily Indoor Classroom Learning Interference for NAS Whidbey Island School POI for Alternative 1

School Point Of Interest		Alternative 1					Increase re Baseline				
			Indoor					Indoor			
			Windows Open		Windows Closed			Windows Open		Windows Closed	
ID	Description	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)
P2	Olympic View Elementary School	66	51	5	41	2	0	0	0	0	0
P4	La Conner Middle School	47	32	1	22	-	0	0	0	0	0
P6	Clover Valley Day School	72	57	7	47	5	0	0	0	0	0
Number of Sites Exceeding 1 Intrusive Event per Hour				2		2			-		-
Minimum Number of Intrusive Events per Hour if Exceeding 1				5		2			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1				7		5			-		-

* Number of annual average busy day events per hour during 8 hour school day (8am-4pm) at or above an indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for windows open and closed, respectively.

3.2.4.4 Potential Hearing Loss

Table 3-14 lists the estimated off-station population and their associated levels of NIPTS for Alternative 1. Up to 14 people with average sensitivity would have lifetime NIPTS of at least 5 dB. For the 10 percent of people with the highest sensitivity, there would be up to 255 people with a lifetime NIPTS of at least 5 dB due to NASWI aircraft noise for Alternative 1.

For NIPTS of at least 5 dB, the number of people affected by Alternative 1 would be identical to the number affected under the Baseline scenario.

Table 3-14. Off-station Population with Potential Hearing Loss Due to Aircraft Operations at NAS Whidbey Island for Alternative 1

$L_{eq(24h)}$ Band	Avg NIPTS (dB) [1]	10th percentile NIPTS (dB) [1]	Alternative 1	
			Population	Population Change Re Baseline
71-72	0.0	2.5	1	0
72-73	0.0	3.0	29	-1
73-74	0.5	3.0	102	-2
74-75	0.5	3.5	336	-5
75-76	1.0	4.0	161	6
76-77	1.0	4.5	99	0
77-78	1.6	5.0	84	0
78-79	2.0	5.5	42	0
79-80	2.5	6.0	31	0
80-81	3.0	7.0	23	0
81-82	3.5	8.0	17	0
82-83	4.0	9.0	12	0
83-84	4.5	10.0	9	0
84-85	5.5	11.0	6	0
85-86	6.0	12.0	4	0
86-87	7.0	13.5	3	0
87-88	7.5	15.0	1	0
88-89	8.5	16.5	0	0

NIPTS (dB)	Avg Population	10th percentile Population	Population Change Re Baseline	
			Avg Population	10th percentile Population
< 5 dB [2]	**946**	**728**	**-2**	**-2**
5 - 10 dB [3]	**14**	**232**	**0**	**0**
>= 10 dB	**0**	**23**	**0**	**0**
Total >= 5 [3]	**14**	**255**	**0**	**0**

Notes: (1) NIPTS values rounded to nearest 0.5 dB
(2) sum of population less than 84 dB L_{eq24} for Avg Population
(3) sum of population greater than or equal to 84-85 dB L_{eq24} band for Avg Population

3.3 Alternative 2 at NAS Whidbey Island

Alternative 2 includes 7 fleet squadrons of P-8A aircraft. The P-3C aircraft would retire. The following subsections describe the modeled flight operations (3.3.1), runway and flight track utilization and modeled flight profiles (3.3.2), pre-flight and maintenance run-up operations (3.3.3), Alternative 2 noise exposure and the supplemental analyses (3.3.4).

3.3.1 Flight Operations

Table 3-15 shows the annual flight operations for the modeled Alternative 2 scenario. Annual flight operations would total 63,063 at Ault Field with approximately 15 percent during the DNL nighttime period (2200-0700). Approximately 76 and 18 percent of Alternative 2 flight operations would be by the EA-18G (FA-18E/F) and P-8A, respectively. The P-3C operations in Table 3-14 are surrogates for C-12 King Air twin turboprop aircraft operations. The EP-3 operations from Baseline would be retired. Identical to Baseline, the C-9A aircraft serves as a surrogate for NASMOD's "Transient Jet Large" category. Approximately 57 percent of the modeled flight operations in the vicinity of the NAS would be patterns (T&G, FCLP, Depart and Re-enter, and GCA).

Table 3-15. Annual Flight Operations at NAS Whidbey Island for Alternative 2

Modeled Aircraft Type	Note	Visual Departure			Instrument Departure (Low TACAN)			Interfacility Departure to Coupeville		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3	8,737	1,064	9,801	-	-	-	105	36	141
P-3C	4	258	-	258	-	-	-	-	-	-
P-8A	5	1,056	47	1,103	1,191	53	1,244	-	-	-
B737-700	6	697	-	697	-	-	-	-	-	-
C-9A	7	342	95	437	-	-	-	-	-	-
TOTAL		**11,090**	**1,206**	**12,296**	**1,191**	**53**	**1,244**	**105**	**36**	**141**

Modeled Aircraft Type	Note	Visual Full Stop Arrival (1)			Overhead Break Arrival			Instrument Full Stop Arrival			TACAN Arrival			Interfacility Arrival from Coupeville (with Break)		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3	3,441	181	3,622	4,859	888	5,747	-	-	-	400	28	428	87	54	141
P-3C	4	240	-	240	-	-	-	18	-	18	-	-	-	-	-	-
P-8A	5	1,892	330	2,222	-	-	-	55	8	63	55	8	63	-	-	-
B737-700	6	662	-	662	-	-	-	38	-	38	-	-	-	-	-	-
C-9A	7	337	79	416	-	-	-	15	6	21	-	-	-	-	-	-
TOTAL		**6,572**	**590**	**7,162**	**4,859**	**888**	**5,747**	**126**	**14**	**140**	**455**	**36**	**491**	**87**	**54**	**141**

Modeled Aircraft Type	Note	Touch and Go (2)			FCLP (2)			Depart & Reenter Pattern (2)			GCA Box (2)			TOTAL		
		Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
FA-18E/F	3	6,134	136	6,270	10,864	6,111	16,975	1,626	36	1,662	5,344	446	5,790	41,597	8,980	50,577
P-3C	4	-	-	-	-	-	-	-	-	-	-	-	-	516	-	516
P-8A	5	3,816	442	4,258	-	-	-	-	-	-	2,412	254	2,666	10,477	1,141	11,618
B737-700	6	292	-	292	-	-	-	-	-	-	588	-	588	2,277	-	2,277
C-9A	7	-	-	-	-	-	-	-	-	-	-	-	-	694	180	874
TOTAL		**10,242**	**578**	**10,820**	**10,864**	**6,111**	**16,975**	**1,626**	**36**	**1,662**	**8,344**	**700**	**9,044**	**55,561**	**10,301**	**65,862**

Source: NASMOD Alt 2

Notes:

1) Includes NASMOD's "Re-Enter Full Stop" operations in order to initially balance arrivals and departures

2) Each circuit counted as 2 operations

3) represents EA-18G aircraft; Per WR 10-22, 80% of non-interfacility departures use Afterburner; 100% of interfacility departures use Mil pow er. FCLP ops from 2012 EA but w ith 64%/36% day/night split from Alt 2.

4) includes C-12 operations only.

5) Modeled as B737-700.

6) represents C-40 operations.

7) represents NASMOD "Transient Jet Large" category; Instrument Full Stop Arrivals modeled as Visual Full Stop.

Average daily events were entered into the noise models, i.e., annual flight operations divided by 365 with pattern operations divided further by 2.

3.3.2 Runway/ Flight Track Utilization and Modeled Flight Profiles

Alternative 2 would utilize the same runway and flight track utilization as Baseline. Flight profiles remain unchanged and the additional P-8A flight profiles are from WR 10-22.

3.3.3 Pre-flight and Maintenance Run-up Operations

No pre-flight run-up was modeled for the P-8A departures. Maintenance run-ups for the P-3 were scaled (down) proportionally to the reduction in flight operations and detailed in Table 3-16. The P-8A run-ups are modeled the same as the Proposed scenario of WR 10-22.

Table 3-16. Maintenance Run-up Operations at NAS Whidbey Island for Alternative 2

Aircraft Type	Engine Type	Run-up Type	In-frame / Out-of-frame	Pad ID	Magnetic Heading (degrees)	Modeled Aircraft Type (if different)	Annual Events	Percent Day (0700 - 2200)	Percent Night (2200 - 0700)	Reported Power Setting	Modeled Power Setting (if different)	Duration (Minutes) Per Event	No. of Engines Running Each Event
EA-18G	F414-GE-400	Water Wash	In-frame	Lo-Pwr (1)	045	FA-18E/F	195	45%	55%	Ground Idle	65% NC	20	1
		Low power	In-frame	Lo-Pwr (1)	045	FA-18E/F	3440	45%	55%	Ground Idle	65% NC	15	1
										80%NC		15	1
		High Power	In-frame	Hi-Pwr (Primary)	315	FA-18E/F	18	100%	0%	Ground Idle	65% NC	10	1
										80%NC		10	1
										90%NC		10	1
										Mil	96% NC	10	1
										AB	Min AB	3	1
P-8A	CFM56-7B-24	Leak Check	In-frame	P3/P8	126	B737-700	48	75%	25%	20% N1 (5400 Lbs)		5	1
		Pressure Check					24	75%	25%	20% N1 (5400 Lbs)		12	1
		Leak Check	In-frame	Hi-Pwr (Primary)	67	B737-700	48	75%	25%	20% N1 (5400 Lbs)		5	1
		Pressure Check					24	75%	25%	20% N1 (5400 Lbs)		12	1
P-3C	T56-A-14	Lo-Pwr	In-frame	Lo-Pwr	126		26	100%	0%	1000 ESHP	1000 ESHP	15	1
		Out-Of-Phase	In-frame	Lo-Pwr	126		2			250 ESHP	250 ESHP	30	4
										450 ESHP	450 ESHP	10	4
										1000 ESHP	1000 ESHP	10	4
		Prop Dynamic Balance	In-frame	Lo-Pwr	126		2			1500 ESHP	1500 ESHP	15	1
		High-PowerD	In-frame	Red Label Delta	315		2			1500 ESHP	1500 ESHP	15	2
										2750 ESHP	2750 ESHP	15	2
										4300 ESHP	4300 ESHP	10	2
		High-PowerF	In-frame	Red Label Foxtrot	-18		2			1500 ESHP	1500 ESHP	15	2
										2750 ESHP	2750 ESHP	15	2
										4300 ESHP	4300 ESHP	10	2
		Prop Dynamic Balancing	In-frame	Hi-Pwr	315		2			1500 ESHP	1500 ESHP	15	1

Notes: (1) Run-up events split equally between three Lo-Pwr run-up locations
(2) P-8 events scaled from 56 annual Leak Checks and 28 annual Pressure Checks from MMA EIS WR 10-22 Alternative 5 (4 P-8 squadrons)
(3) P-3 events scaled down by numbers of flight operations from Baseline

3.3.4 Alternative 2 Noise Exposure

Utilizing the data described in Sections 3.2.1 through 3.2.3, NMAP was used to calculate and plot the 65 dB through 85 dB DNL contours in increments of 5 dB for average daily aircraft events as shown in Figure 3-7. The 65 dB DNL contour would extend nearly to the eastern shore of the mainland across Skagit Bay, which is the location where aircraft flying GCA approaches would pass through 1000 feet AGL. The 65 dB DNL contour otherwise would extend over land approximately 3 to 4 miles from the center of the airfield, the result of overlapping T&G and FCLP flight tracks and operations. The 80 dB DNL contour would extend off-station to the north by approximately 0.5 miles. The 85 dB DNL contours would extend off-station by nearly 1 mile to the east and nearly 0.2 mile to the north. The easterly extensions of these contours would be primarily due to the arrival portion of EA-18G T&G patterns on Runway 25.

Figure 3-8 shows a comparison of the 65 and 75 dB DNL contours. The Alternative 2 contours are nearly identical to Baseline. This is because the EA-18G is the primary driver of the DNL contours and their operations would not change relative to Baseline. The P-3/P-8A operations are not sufficient in either SEL or numbers of operations to cause a change.

The total DNL at each of six POI was computed and is listed in Table 3-17. The greatest DNL of 76 dB would continue to occur at Clover Valley Day School due to the EA-18G FCLP patterns on Runway 25 while the second greatest of 70 dB at Deception Pass State Park would remain the EA-18G break arrivals to Runway 14 during the DNL nighttime. Olympic View Elementary School would have a DNL of 66 dB due to Growler Depart and Reenter Patterns to Runway 07. The DNL at the remaining three locations would be less than 65 dB.

Changes in DNL at each of the POI relative to Baseline would be less than 1 dB except for Olympic View Elementary School. The 1 dB increase at this school would be due to a 0.1 dB contribution of P-8A aircraft and mathematical rounding.

Table 3-17. DNL at NAS Whidbey Island POI for Alternative 2

Point of Interest		DNL (dB)	Increase re Baseline (dB)
ID	Description		
P1	City Beach Park	56	-
P2	Olympic View Elementary School	66	+1
P3	Deception Pass State Park	70	-
P4	La Conner Middle School	47	-
P5	Picnic Point	47	-
P6	Clover Valley Day School	76	-

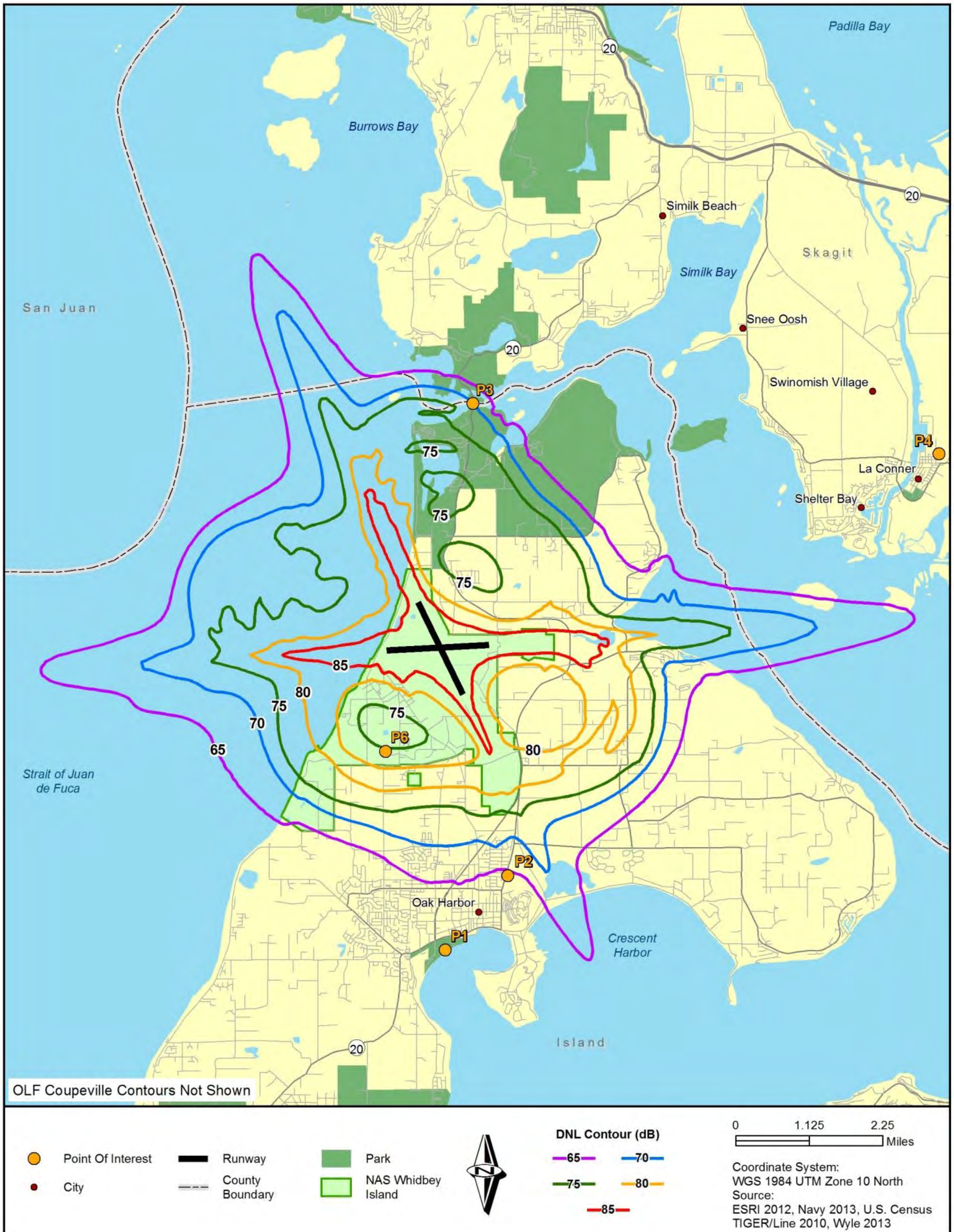

Figure 3-7. DNL Contours for Average Daily Aircraft Operations at NAS Whidbey Island for Alternative 2

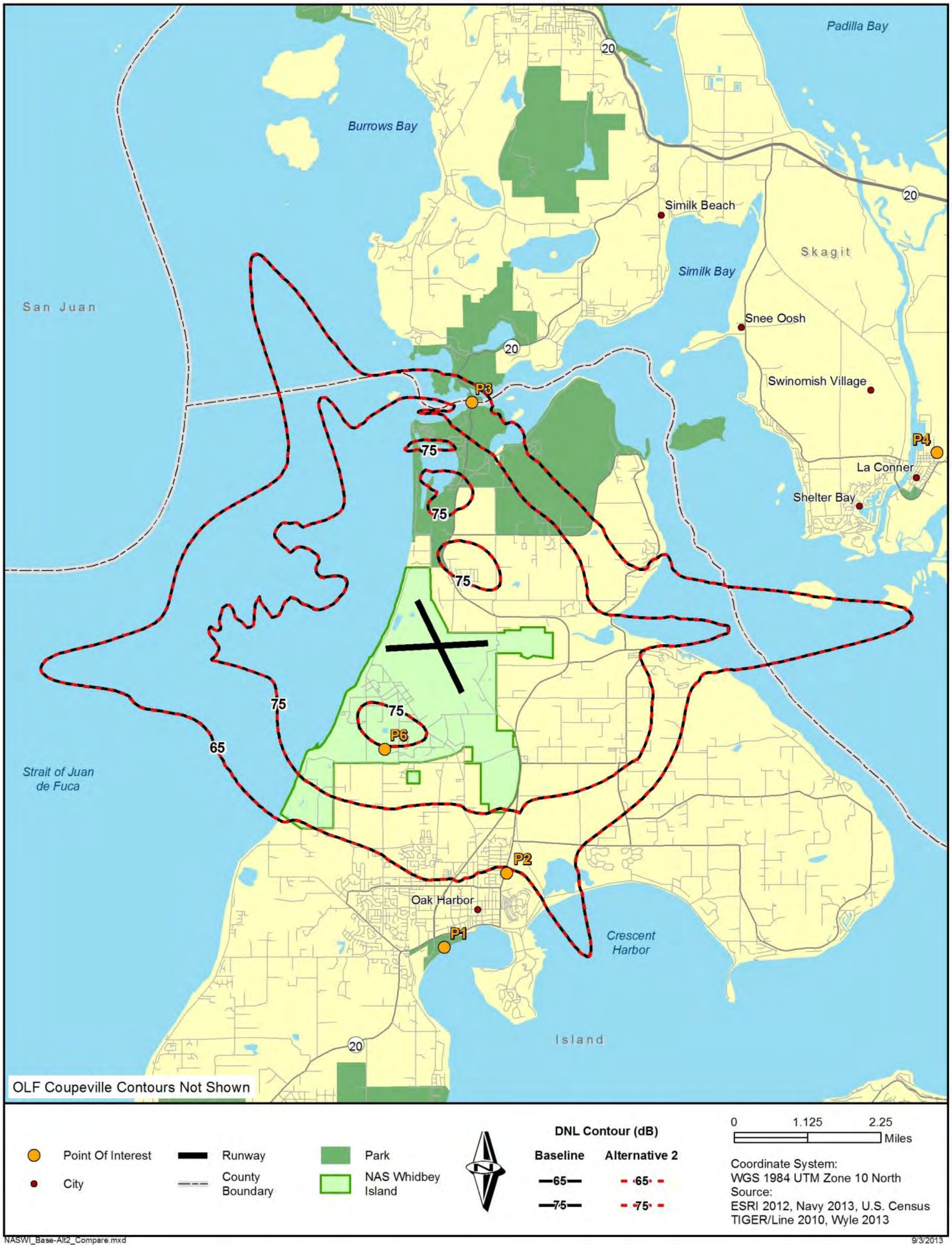

Figure 3-8. Comparison of Select DNL Contours at NAS Whidbey Island for Baseline and Alternative 2 Scenarios

The Alternative 2 aircraft operations were further analyzed to determine their relative effect on the overall DNL at the six POI. Figure 3-9 depicts the P-3C, P-8A, FA-18E/F, and Other (C-9A) aircraft DNL contributions. At all locations the EA-18G (listed by the surrogate FA-18E/F) would be the dominant contributor. The EA-18G DNL component is 10 to 23 dB greater than any of the other aircraft types. This would be due to the EA-18G owning most of the total flight operations (76 percent), and the SEL of the EA-18G being 8 to 20 dB greater than the other aircraft modeled at NASWI.

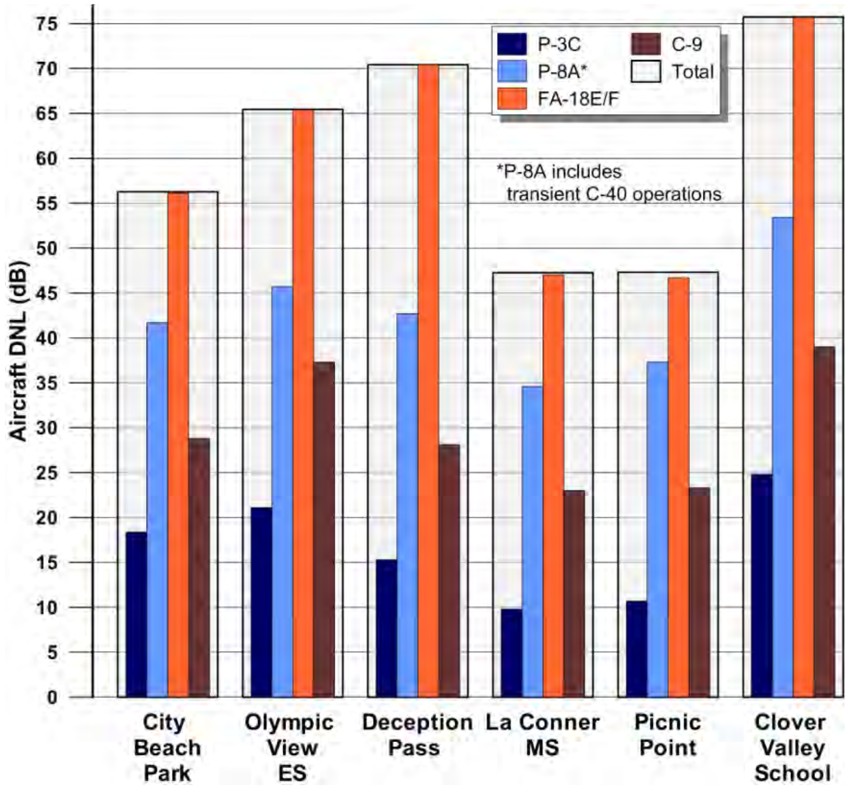

Figure 3-9. DNL Contributors at NAS Whidbey Island POI for Alternative 2

3.3.4.1 Potential for Sleep Disturbance

Table 3-18 presents the results of the sleep disturbance analysis for the six POI. For Alternative 2, the PA would range from 6 percent to 48 percent with windows open and would range from 1 percent to 34 percent with windows closed. The EA-18G T&G pattern operations on Runways 25 and 14 would be the primary contributor to the PA at all POI. A maximum increase of 1 percent in PA would occur at all of the POI except La Conner Middle School. The increase would be primarily due to the P-8A T&G pattern operations. Although the P-8A would conduct approximately the same number of T&G operations during DNL nighttime as the P-3 aircraft in Baseline, the P-8A is up to 10 dB greater in SEL than the P-3.

Table 3-18. Average Nightly (2200-0700) Probability of Awakening for NAS Whidbey Island POI for Alternative 2

Point of Interest		Alternative 2		Increase Re Baseline	
ID	Description	Windows Open	Windows Closed	Windows Open	Windows Closed
P1	City Beach Park	25%	13%	+1%	-
P2	Olympic View Elementary School	33%	21%	+1%	-
P3	Deception Pass State Park	31%	16%	+1%	-
P4	La Conner Middle School	6%	1%	-	-
P5	Picnic Point	6%	1%	+1%	-
P6	Clover Valley Day School	48%	34%	+1%	+1%

*NLRs of 15 dB and 25 dB for w indow s open and closed, respectively

3.3.4.2 *Potential for Indoor Speech Interference*

Table 3-19 present the results of the speech interference analysis for Alternative 2 for the six POI. Four of the six sites would have more than one speech interfering event per daytime hour for windows open with the maximum of seven events per hour occurring at the Clover Valley Day School area. Relative to Baseline, an increase from one event per hour would occur at the Olympic View Elementary School area (windows closed) and at the Clover Valley Day School area (windows open or closed). The increase would be due to the P-8A aircraft. Although the P-8A would have fewer operations than the P-3, the P-8's L_{max} would be greater than that of the P-3. The EA-18G would remain the primary contributor to speech interfering events at all POI.

Table 3-19. Potential for Average Daily Indoor Speech Interference for NAS Whidbey Island POI for Alternative 2

Point of Interest		Indoor Number of Events per Daytime Hour*			
		Alternative 2		Increase Re Baseline	
ID	Description	Windows Open	Windows Closed	Windows Open	Windows Closed
P1	City Beach Park	2	0	-	-
P2	Olympic View Elementary School	4	2	-	+1
P3	Deception Pass State Park	4	1	-	-
P4	La Conner Middle School	1	0	-	-
P5	Picnic Point	0	0	-	-
P6	Clover Valley Day School	7	5	+1	+1
Number of Sites Exceeding 1 Intrusive Event per Hour		4	2	-	+1
Minimum Number of Intrusive Events per Hour if Exceeding 1		2	2	-	-2
Maximum Number of Intrusive Events per Hour if Exceeding 1		7	5	+1	+1

* Number of Annual Average Daily DNL Daytime Events At or Above an Indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for w indow s open and closed, respectively

3.3.4.3 Potential for Classroom Learning Interference

Table 3-20 contains the results of the classroom learning interference analysis for Olympic View Elementary, La Conner Middle School, and Clover Valley Day School. For Alternative 2, there would be no change relative to Baseline except for an increase of 1 event per hour at Clover Valley Day School with windows open. Olympic View and Clover Valley Day School would continue to exceed the indoor $L_{eq(8h)}$ threshold of 35 dB for continuous noise by 16 dB and 22 dB, respectively, with windows open and 6 dB and 12 dB, respectively, for windows closed. The EA-18G Depart and Re-enter patterns would remain the primary cause for the $L_{eq(8h)}$ at Olympic View and the EA-18G Touch and Go patterns would continue to be the primary cause for the $L_{eq(8h)}$ at Clover Valley Day School. The EA-18G departures would continue to drive the potentially interfering events at all school locations.

Table 3-20. Potential for Average Daily Indoor Classroom Learning Interference for NAS Whidbey Island School POI for Alternative 2

School Point Of Interest		Alternative 2					Increase re Baseline				
			Indoor					Indoor			
			Windows Open		Windows Closed			Windows Open		Windows Closed	
ID	Description	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	Outdoor $L_{eq(8h)}$ (dB)	$L_{eq(8h)}$ (dB)	Events per Hour(1)	$L_{eq(8h)}$ (dB)	Events per Hour(1)
P2	Olympic View Elementary School	66	51	5	41	2	0	0	0	0	0
P4	La Conner Middle School	47	32	1	22	-	0	0	0	0	0
P6	Clover Valley Day School	72	57	8	47	5	0	0	+1	0	0
Number of Sites Exceeding 1 Intrusive Event per Hour				2		2			-		-
Minimum Number of Intrusive Events per Hour if Exceeding 1				5		2			-		-
Maximum Number of Intrusive Events per Hour if Exceeding 1				8		5			+1		-

* Number of annual average busy day events per hour during 8 hour school day (8am-4pm) at or above an indoor Maximum (single-event) Sound Level (Lmax) of 50 dB; NLRs of 15 dB and 25 dB for windows open and closed, respectively.

3.3.4.4 Potential Hearing Loss

Table 3-21 lists the estimated off-station population and their associated levels of NIPTS for Alternative 2. Up to 14 people with average sensitivity would have lifetime NIPTS of at least 5 dB. For the 10 percent of people with the highest sensitivity, there would be up to 255 people with a lifetime NIPTS of at least 5 dB due to NASWI aircraft noise for Alternative 2.

For NIPTS of at least 5 dB, the number of people affected by Alternative 2 would be identical to the number of people affected under the Baseline scenario (and Alternative 1).

Table 3-21. Off-station Population with Potential Hearing Loss Due to Aircraft Operations at NAS Whidbey Island for Alternative 2

$L_{eq(24h)}$ Band	Avg NIPTS (dB) (1)	10^{th} percentile NIPTS (dB) (1)	Alternative 2: Population	Alternative 2: Population Change Re Baseline
71-72	0.0	2.5	1	0
72-73	0.0	3.0	29	-1
73-74	0.5	3.0	102	-2
74-75	0.5	3.5	336	-5
75-76	1.0	4.0	161	6
76-77	1.0	4.5	99	0
77-78	1.6	5.0	84	0
78-79	2.0	5.5	42	0
79-80	2.5	6.0	31	0
80-81	3.0	7.0	23	0
81-82	3.5	8.0	17	0
82-83	4.0	9.0	12	0
83-84	4.5	10.0	9	0
84-85	5.5	11.0	6	0
85-86	6.0	12.0	4	0
86-87	7.0	13.5	3	0
87-88	7.5	15.0	1	0
88-89	8.5	16.5	0	0

NIPTS (dB)	Avg Population	10^{th} percentile Population	Population Change Re Baseline: Avg Population	Population Change Re Baseline: 10^{th} percentile Population
< 5 dB (2)	**946**	**728**	**-2**	**-2**
5 - 10 dB (3)	**14**	**232**	**0**	**0**
>= 10 dB	**0**	**23**	**0**	**0**
Total >= 5 (3)	**14**	**255**	**0**	**0**

Notes: (1) NIPTS values rounded to nearest 0.5 dB
(2) sum of population less than 84 dB L_{eq24} for Avg Population
(3) sum of population greater than or equal to 84-85 dB L_{eq24} band for Avg Population

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Appendix A

REPRESENTATIVE FLIGHT PERFORMANCE PROFILES FOR NAS JACKSONVILLE

This appendix provides scaled plots of individual flight profiles for each modeled aircraft type representative of each type of operation. The background is either a compressed version of ARC Digitized Raster Graphics (CADRG) or aerial image files. The NAS Jacksonville boundary is shown in red.

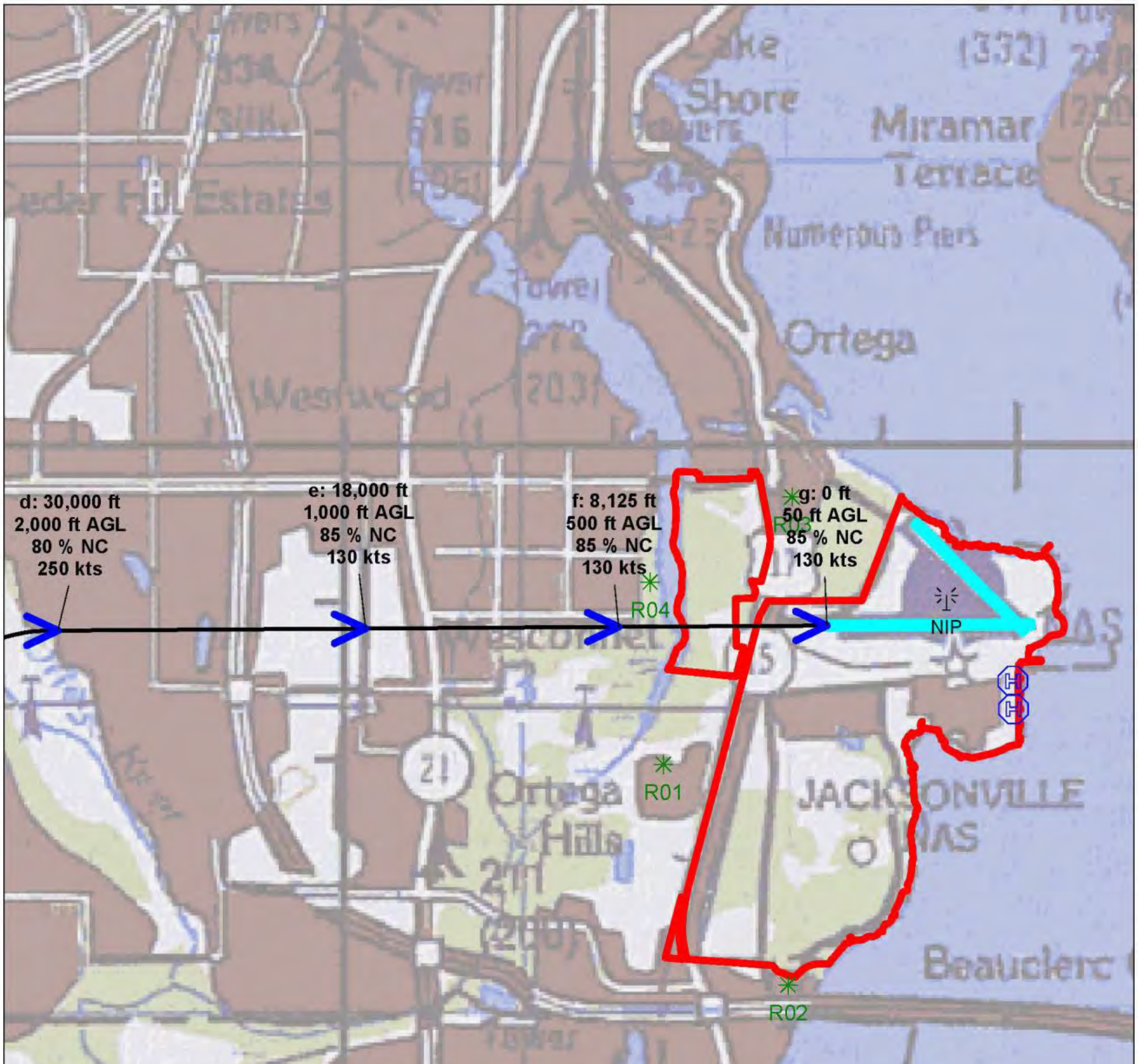
The flight profiles are shown in the following order:

Profile Pages	Aircraft
A-2 - A-6	FA-18E/F
A-7 - A-11	P-8A
A-12 - A-17	P-3C
A-18 - A-21	C-5
A-22 - A-24	C-9
A-25 - A-29	E-2C
A-30 - A-33	SH-60B

Each figure includes a table describing the profile parameters of the associated flight track. The columns of the profile data tables are described below:

Column Heading	Description
Point	Sequence letter along flight track denoting change in flight parameters
Distance (feet)	Distance along flight track from runway threshold in feet
Height (feet)	Altitude of aircraft in feet Above Ground Level (AGL) or relative to Mean Sea Level (MSL); In this model, AGL reflects Altitude above Field Elevation (AFE).
Power (Appropriate Unit)*	Engine power setting and Drag Configuration/Interpolation Code (defines sets of interpolation code in NOISEMAP (F for FIXED, P for PARALLEL, V for VARIABLE)).
Speed (kts)	Indicated airspeed of aircraft in knots
Yaw Angle (degrees)**	Angle of the aircraft relative to its vertical axis in degrees; positive nose left
Angle of Attack (degrees)**	Angle of the aircraft, not of the wing; angle between the climb angle and the pitch angle, in degrees, positive nose up. The climb angle is the angle between the horizontal and the velocity vector (same convention). The pitch angle is the angle between the horizontal and the thrust vector (same convention).
Roll Angle (degrees)**	Angle of the aircraft relative to its longitudinal axis in degrees; positive left side down.
Nacelle Angle (degrees)***	Angle of engine nacelle pylon relative to the horizontal (airplane) mode; positive up; maximum of 90

Notes: * not applicable to rotary wing aircraft
** for rotary wing aircraft only
*** for tilt-rotor aircraft (e.g., MV-22B) only; fixed to 90 degrees for RNM helicopters



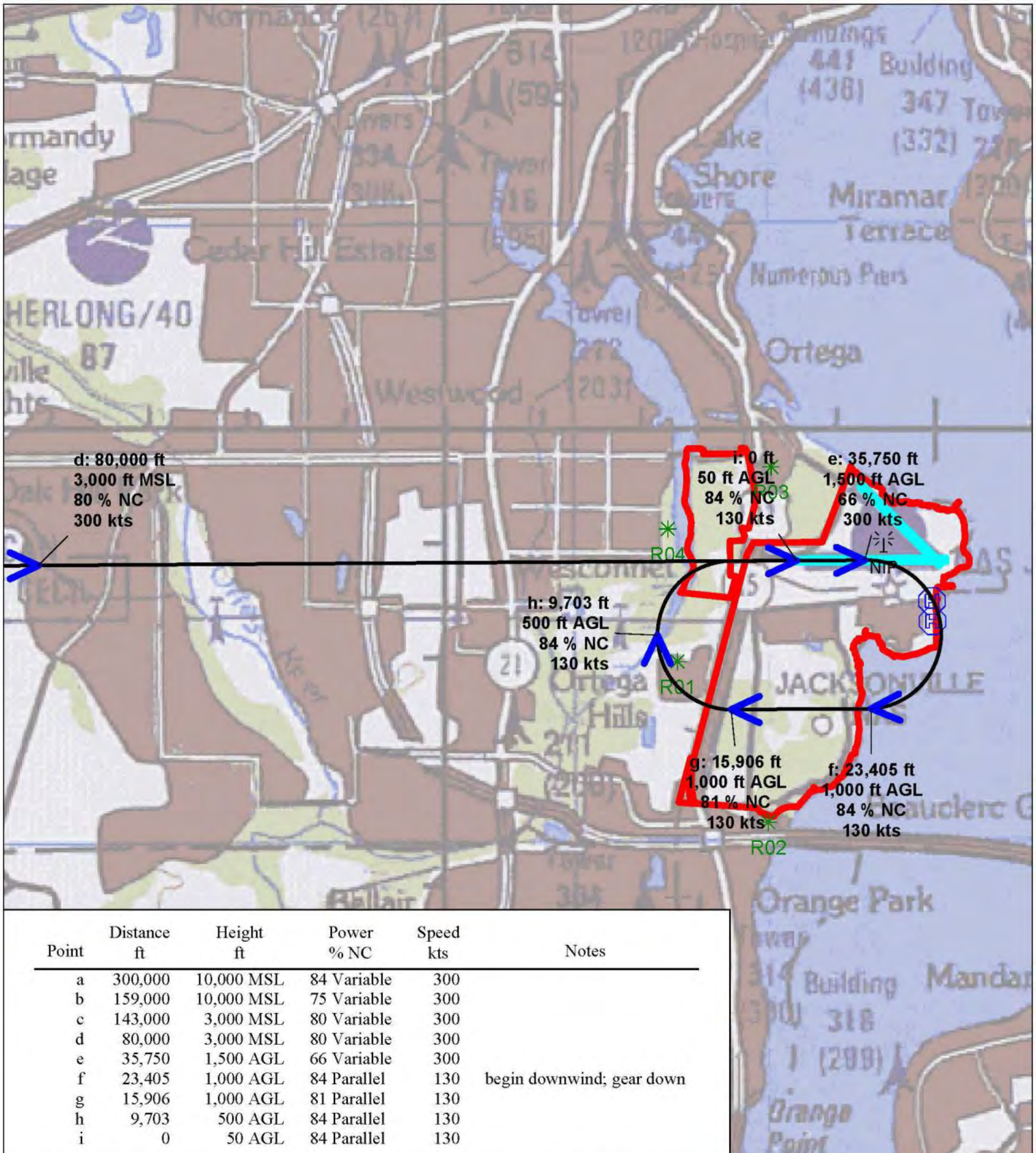
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	185,000	10,000 MSL	84 Variable	300	
b	121,000	10,000 MSL	75 Variable	300	
c	97,000	5,000 MSL	80 Variable	300	
d	30,000	2,000 AGL	80 Parallel	250	gear down
e	18,000	1,000 AGL	85 Parallel	130	
f	8,125	500 AGL	85 Parallel	130	
g	0	50 AGL	85 Parallel	130	

NAS Jacksonville (22 ft MSL) Flight Profile F18A1 - Standard Arrival
Based F-18E/F
on Runway 10, Flight Track 10A1 - VFR Arrival
WR 02-08 Appx D Page D-43

0 4,000 8,000 12,000 16,000 20,000 24,000

Scale in Feet 1:81,300 (1 inch = 6,780 feet)

N



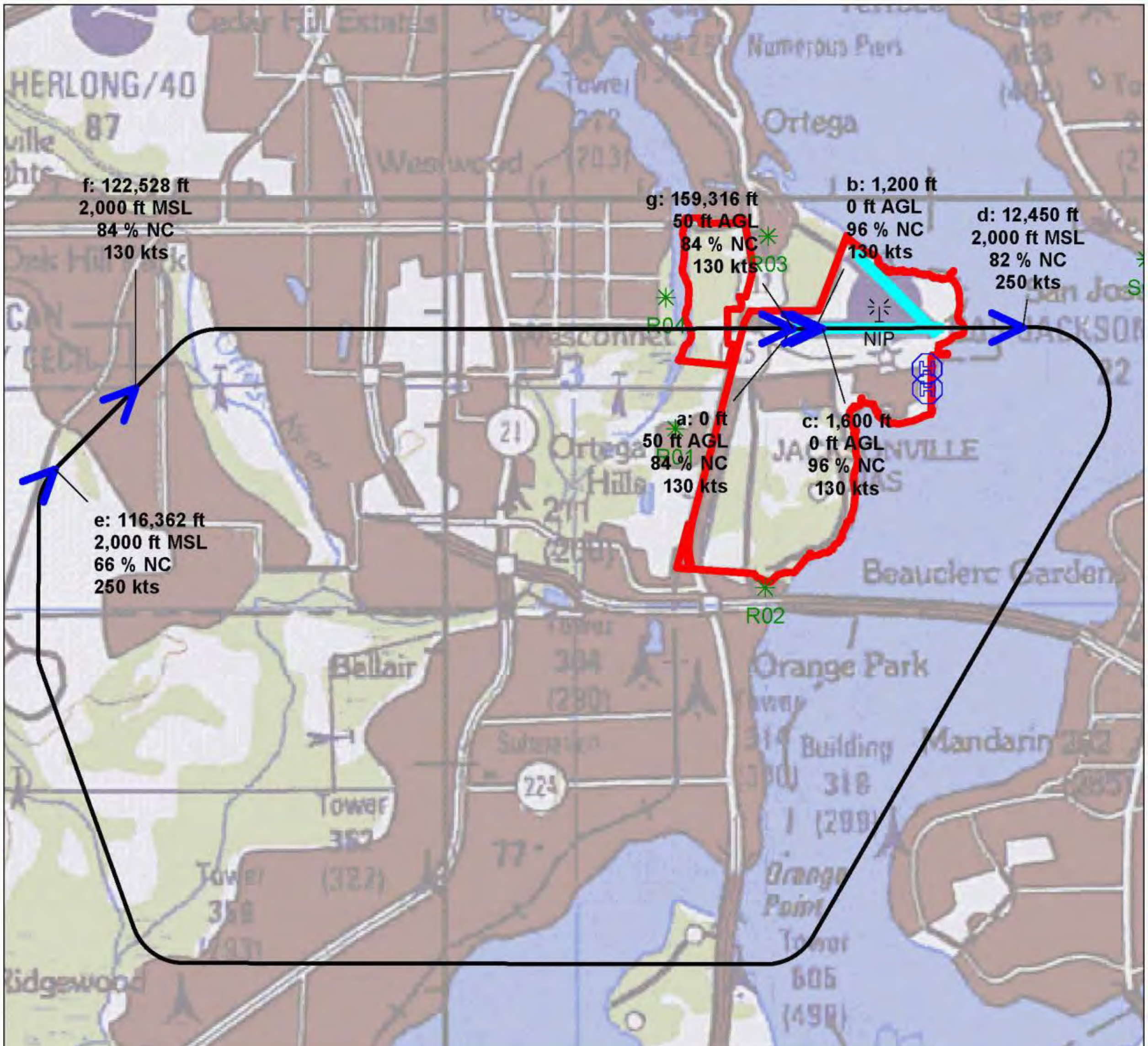
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	300,000	10,000 MSL	84 Variable	300	
b	159,000	10,000 MSL	75 Variable	300	
c	143,000	3,000 MSL	80 Variable	300	
d	80,000	3,000 MSL	80 Variable	300	
e	35,750	1,500 AGL	66 Variable	300	
f	23,405	1,000 AGL	84 Parallel	130	begin downwind; gear down
g	15,906	1,000 AGL	81 Parallel	130	
h	9,703	500 AGL	84 Parallel	130	
i	0	50 AGL	84 Parallel	130	

NAS Jacksonville (22 ft MSL) Flight Profile F18O1 - Overhead Break Arrival Based F-18E/F
on Runway 10, Flight Track 10O1 - Overhead Break Arrival (1.3 NM Abeam, 1.2 NM Downwind, 0.58 NM Final)
WR 02-08 Appx D Page D-43

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000

Scale in Feet 1:102,000 (1 inch = 8,470 feet)

N



Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	50 AGL	84 Parallel	130	-2.4° , -500 fpm, 5 sec
b	1,200	0 AGL	96 Variable	130	+0° , +0 fpm, 2 sec
c	1,600	0 AGL	96 Variable	130	+10.3° , +3500 fpm, 34 sec
d	12,450	2,000 MSL	82 Variable	250	+0° , +0 fpm, 246 sec; reach pattern altitude
e	116,362	2,000 MSL	66 Parallel	250	+0° , +0 fpm, 19 sec
f	122,528	2,000 MSL	84 Parallel	130	-3° , -700 fpm, 168 sec; 3 degree GS intercept
g	159,316	50 AGL	84 Parallel	130	

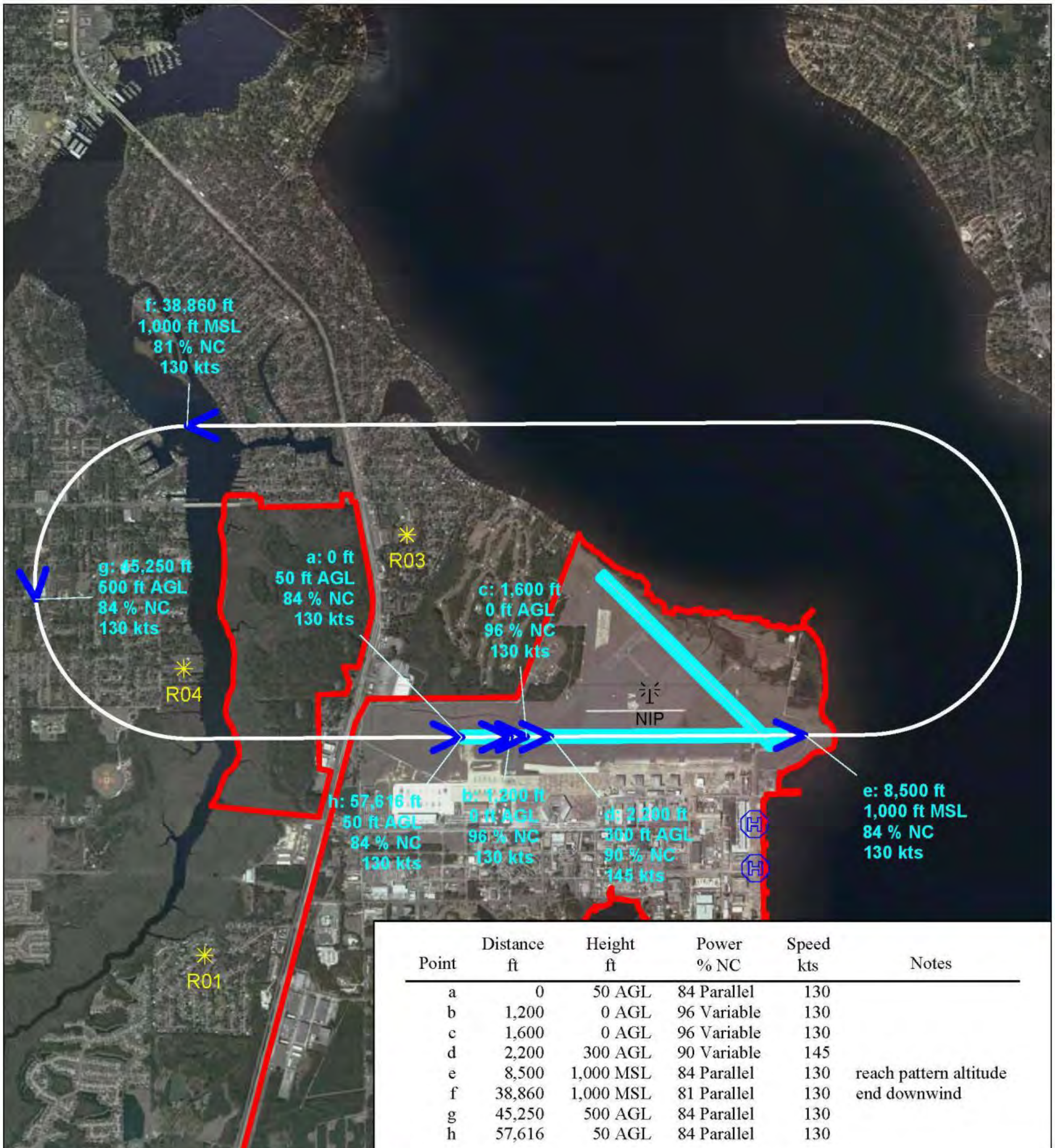
NAS Jacksonville (22 ft MSL) Flight Profile F18G1 - GCA Box Pattern Based F-18E/F on Runway 10, Flight Track 10G1 - GCA Box Pattern (5.4 NM Abeam, 5.18 NM Downwind, 5.13 NM Final)

WR 02-08 Appx D Page D-43

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:114,000 (1 inch = 9,490 feet)

N



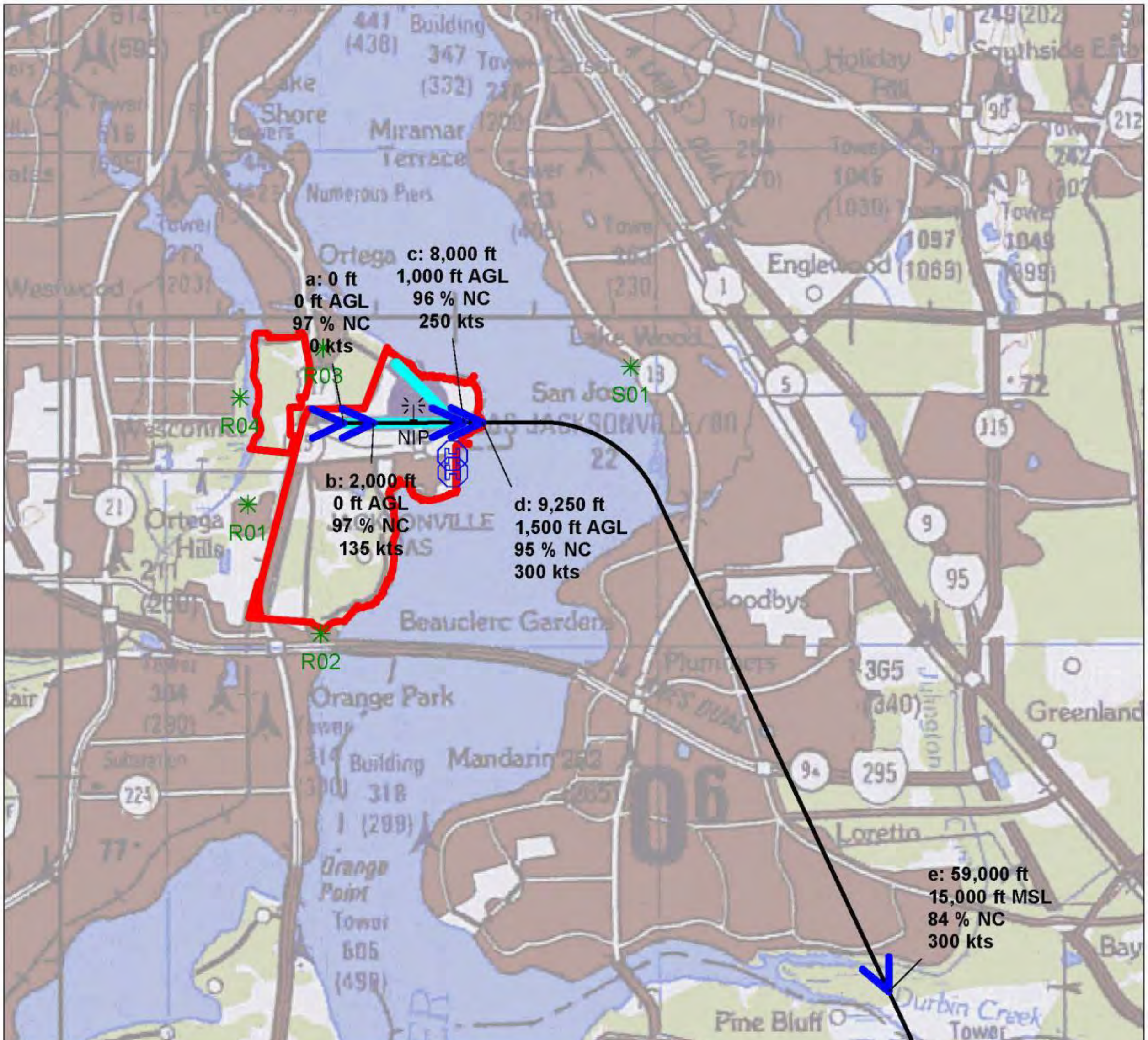
Point	Distance ft	Height ft	Power % NC	Speed kts	Notes
a	0	50 AGL	84 Parallel	130	
b	1,200	0 AGL	96 Variable	130	
c	1,600	0 AGL	96 Variable	130	
d	2,200	300 AGL	90 Variable	145	
e	8,500	1,000 MSL	84 Parallel	130	reach pattern altitude
f	38,860	1,000 MSL	81 Parallel	130	end downwind
g	45,250	500 AGL	84 Parallel	130	
h	57,616	50 AGL	84 Parallel	130	

NAS Jacksonville (22 ft MSL) Flight Profile F18T1 - Touch & Go
Based F-18E/F
on Runway 10, Flight Track 10T3 - Touch and Go Pattern (1.25 NM Abeam, 2.8 NM Downwind, 1.1 NM Final)
WR 02-08 Appx D Page D-43
1.25 NM Abeam, 2.8 NM Downwind, 1.15 NM Final

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000

Scale in Feet 1:47,900 (1 inch = 3,990 feet)

N



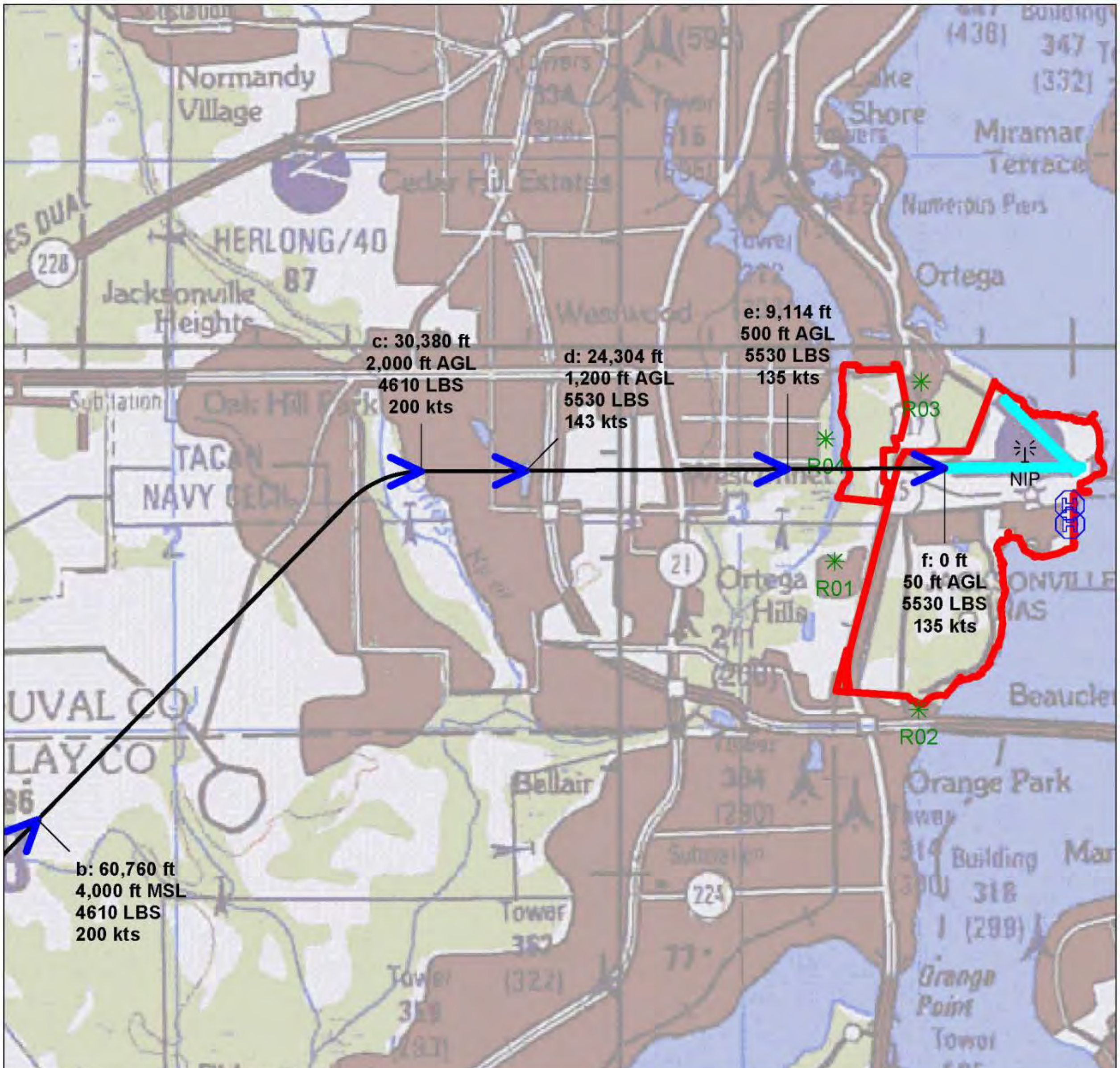
Point	Distance ft	Height ft	Power % NC	Speed kts
a	0	0 AGL	97 Min A/B	0
b	2,000	0 AGL	97 Afterburner	135
c	8,000	1,000 AGL	96 Variable	250
d	9,250	1,500 AGL	95 Variable	300
e	59,000	15,000 MSL	84 Variable	300
f	200,000	15,000 MSL	84 Variable	300

NAS Jacksonville (22 ft MSL) Flight Profile F18D1 - Standard Afterburner Departure
Based F-18E/F
on Runway 10, Flight Track 10D1 - Departure Heading 160
WR 02-08 Appx D Page D-43
Prior to brake release, aircraft sits at 97 % NC Min A/B for 1 sec

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:140,000 (1 inch = 11,700 feet)

N



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	185,000	4,000 MSL	4610 Variable	200	Angle = 0°, RoC/D = 0 fpm, Duration = 368 sec
b	60,760	4,000 MSL	4610 Variable	200	Angle = -3.7°, RoC/D = -1300 fpm, Duration = 90 sec
c	30,380	2,000 AGL	4610 Variable	200	Angle = -7.5°, RoC/D = -2300 fpm, Duration = 21 sec
d	24,304	1,200 AGL	5530 Parallel	143	Angle = -2.6°, RoC/D = -600 fpm, Duration = 65 sec; gear down
e	9,114	500 AGL	5530 Parallel	135	Angle = -2.8°, RoC/D = -700 fpm, Duration = 40 sec
f	0	50 AGL	5530 Parallel	135	Angle = N/A°, RoC/D = N/A fpm, Duration = N/A sec

NAS Jacksonville (22 ft MSL) Flight Profile P8A1 - Standard Arrival
P-8 (Modeled as B-737-700*)
on Runway 10, Flight Track 10A1 - VFR Arrival
P-8A Profiles by Dan Duquette, Mar07

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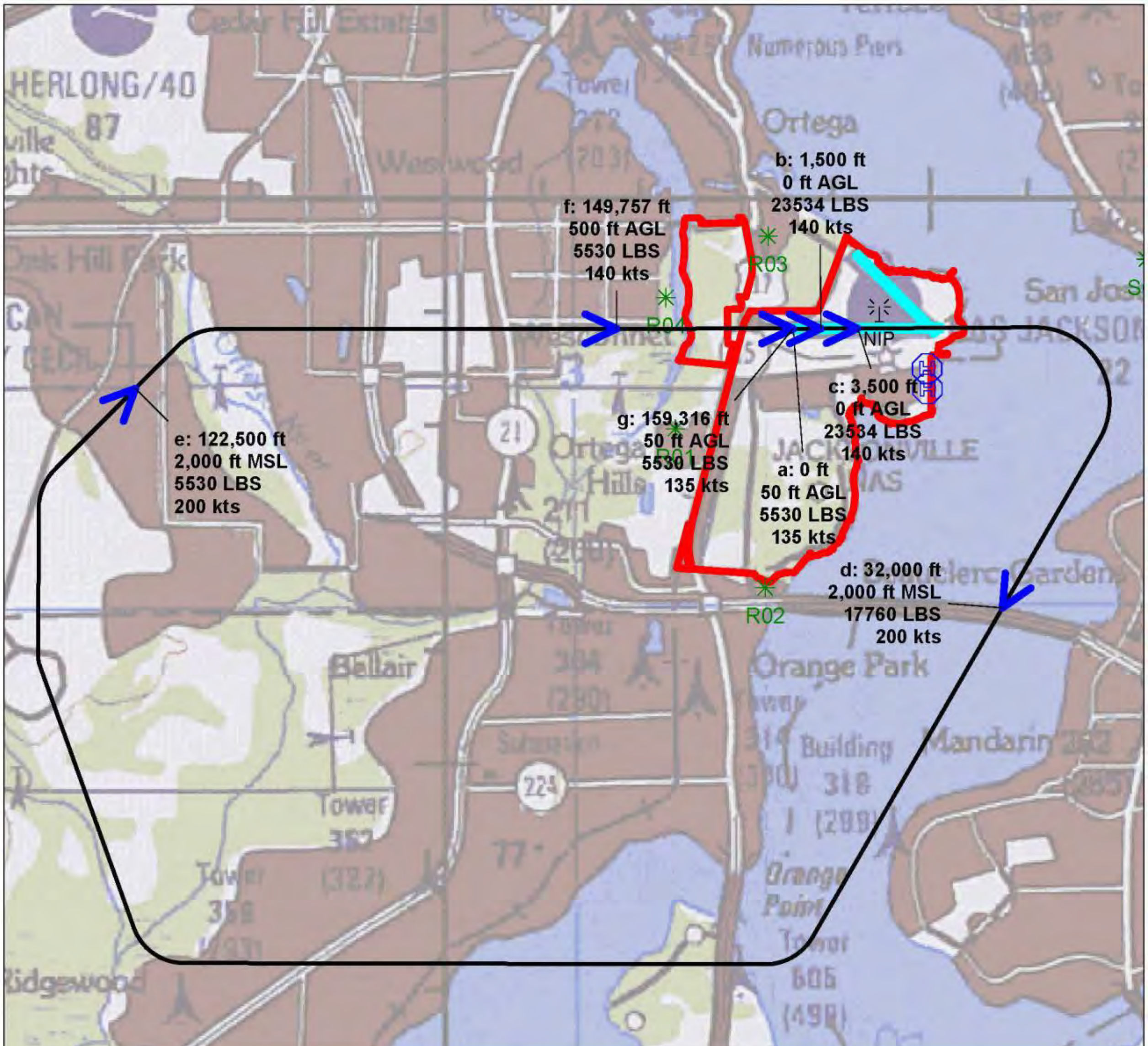
Scale in Feet 1:119,000 (1 inch = 9,920 feet)



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	50 AGL	5530 Parallel	135	Angle = -1.9°, RoC/D = -500 fpm, Duration = 6 sec
b	1,500	0 AGL	23534 Variable	140	Angle = 0°, RoC/D = 0 fpm, Duration = 8 sec
c	3,500	0 AGL	23534 Variable	140	Angle = 4°, RoC/D = 1200 fpm, Duration = 99 sec
d	32,000	2,000 MSL	17760 Variable	200	Angle = 0°, RoC/D = 0 fpm, Duration = 298 sec
e	122,500	2,000 MSL	5530 Parallel	200	Angle = -3.1°, RoC/D = -900 fpm, Duration = 95 sec; gear down
f	149,757	500 AGL	5530 Parallel	140	Angle = -2.7°, RoC/D = -700 fpm, Duration = 41 sec
g	159,316	50 AGL	5530 Parallel	135	Angle = N/A°, RoC/D = N/A fpm, Duration = N/A sec

NAS Jacksonville (22 ft MSL) Flight Profile P8G1 - GCA Pattern
P-8 (Modeled as B-737-700*)
on Runway 10, Flight Track 10G1 - GCA Box Pattern (5.4 NM Abeam, 5.18 NM Downwind, 5.13 NM Final)
P-8A Profiles by Dan Duquette, Mar07

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:114,000 (1 inch = 9,490 feet)

N

Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	50 AGL	5530 Parallel	135	Angle = -1.9°, RoC/D = -500 fpm, Duration = 6 sec
b	1,500	0 AGL	23534 Variable	140	Angle = 0°, RoC/D = 0 fpm, Duration = 8 sec
c	3,500	0 AGL	23534 Variable	140	Angle = 3°, RoC/D = 800 fpm, Duration = 76 sec
d	22,095	1,000 MSL	17760 Variable	150	Angle = 0°, RoC/D = 0 fpm, Duration = 59 sec; reach pattern alt
e	37,000	1,000 MSL	5530 Parallel	150	Angle = -3.2°, RoC/D = -800 fpm, Duration = 69 sec; begin descent
f	53,616	50 AGL	5530 Parallel	135	Angle = N/A°, RoC/D = N/A fpm, Duration = N/A sec

NAS Jacksonville (22 ft MSL) Flight Profile P8T1 - Touch & Go
P-8 (Modeled as B-737-700*)
on Runway 10, Flight Track 10T2 - Touch and Go Pattern (1.25 NM Abeam, 2.4 NM Downwind, 0.75 NM Final)

P-8A Profiles by Dan Duquette, Mar07

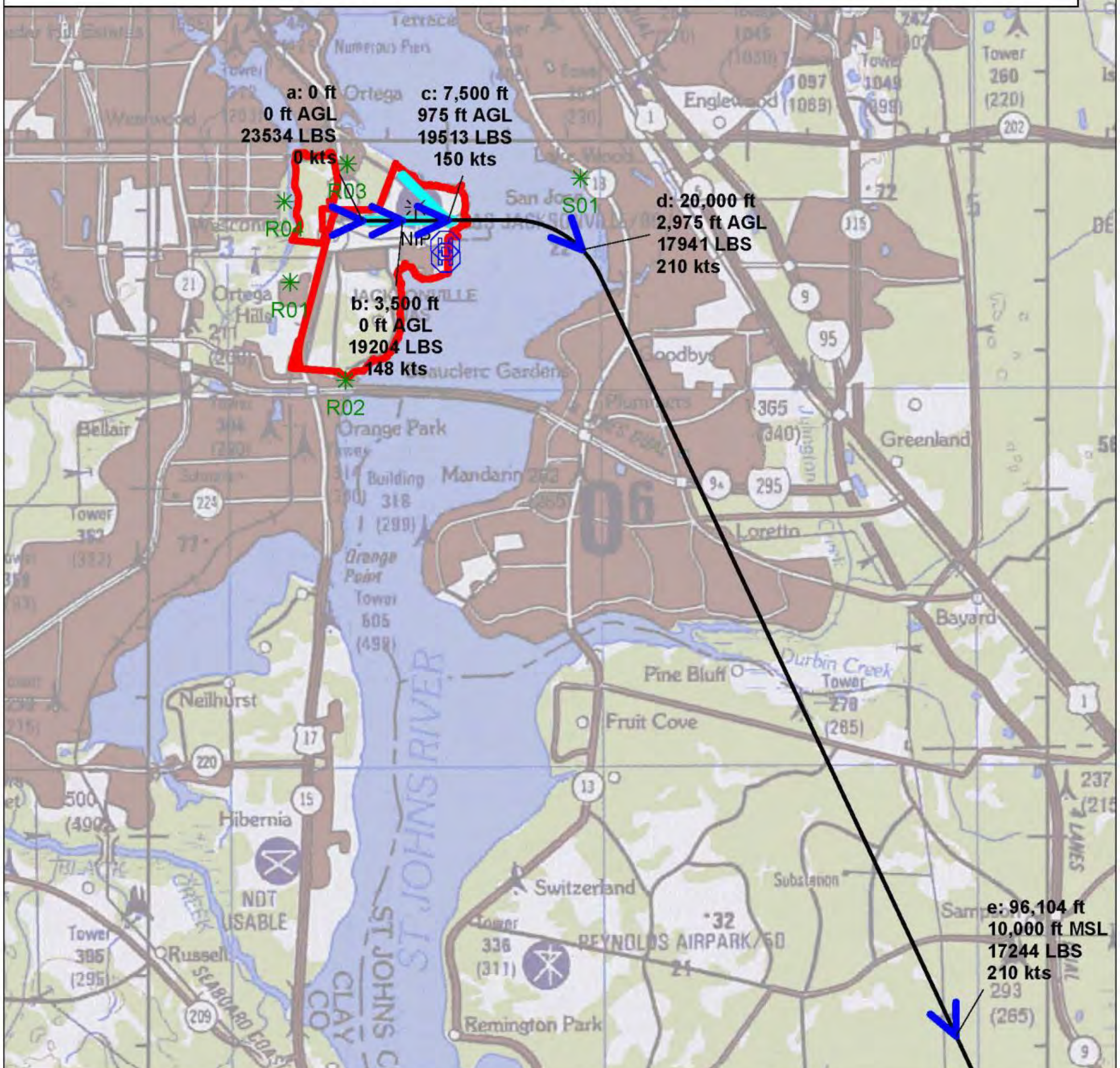
1.25 NM Abeam, 2.45 NM Downwind, 0.8 NM Final

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000

Scale in Feet 1:44,000 (1 inch = 3,670 feet)

N

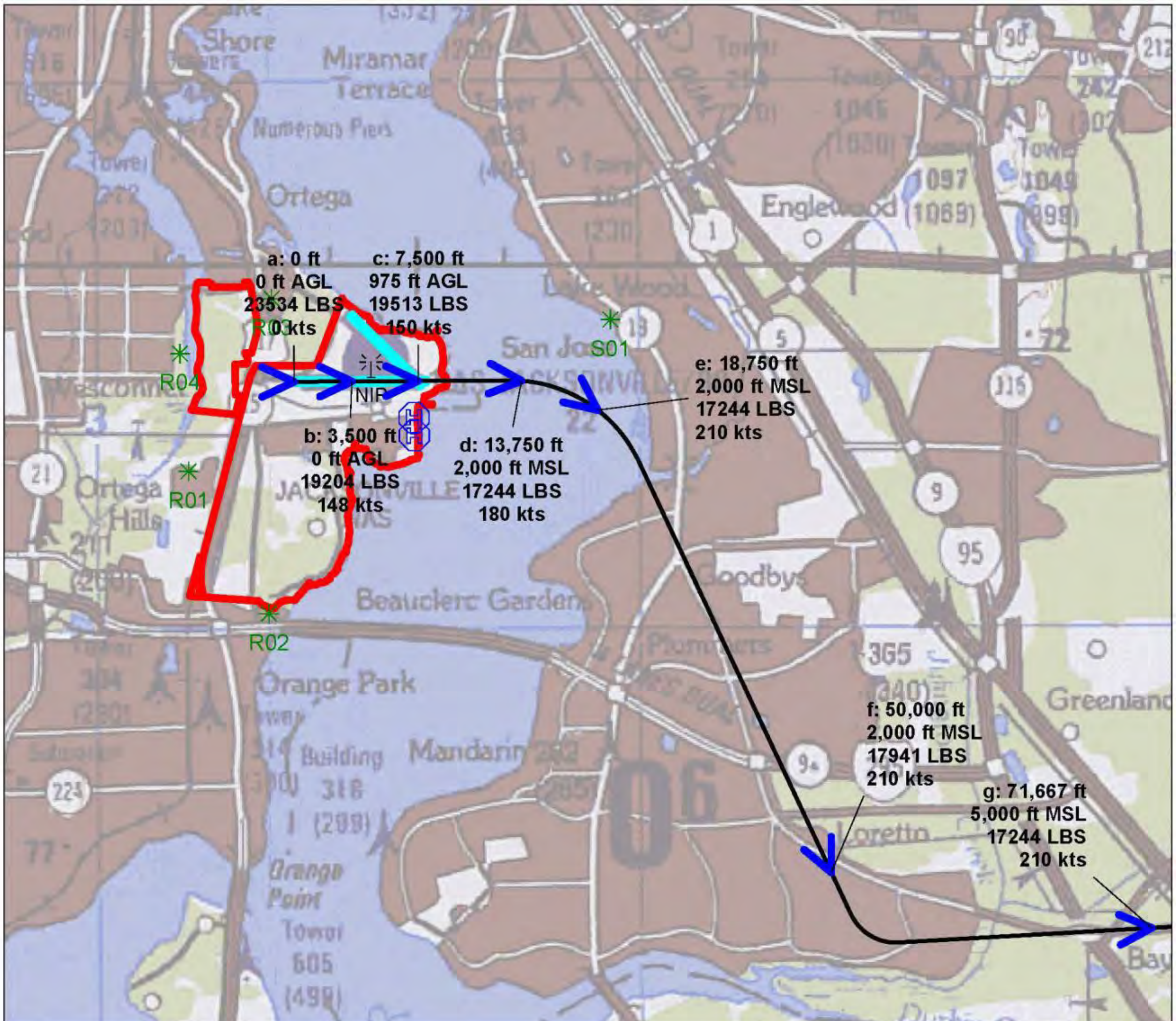
Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	0 AGL	23534 Variable	0	0 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 28 sec
b	3,500	0 AGL	19204 Variable	148	0.6 NM, Angle = 13.7°, RoC/D = 3600 fpm, Duration = 16 sec
c	7,500	975 AGL	19513 Variable	150	1.2 NM, Angle = 9.1°, RoC/D = 2900 fpm, Duration = 41 sec
d	20,000	2,975 AGL	17941 Variable	210	3.3 NM, Angle = 5.3°, RoC/D = 1900 fpm, Duration = 215 sec
e	96,104	10,000 MSL	17244 Variable	210	15.8 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 293 sec
f	200,000	10,000 MSL	17244 Variable	210	32.9 NM, Angle = 0°, RoC/D = 0 fpm, Duration = N/A sec



NAS Jacksonville (22 ft MSL) Flight Profile P8D1 - Standard Departure
P-8 (Modeled as B-737-700*)
on Runway 10, Flight Track 10D1 - Departure Heading 160
P-8A Profiles by Dan Duquette, Mar07

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:180,000 (1 inch = 15,000 feet)



Point	Distance ft	Height ft	Power LBS	Speed kts	Notes
a	0	0 AGL	23534 Variable	0	0 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 28 sec
b	3,500	0 AGL	19204 Variable	148	0.6 NM, Angle = 13.7°, RoC/D = 3600 fpm, Duration = 16 sec
c	7,500	975 AGL	19513 Variable	150	1.2 NM, Angle = 9.1°, RoC/D = 2600 fpm, Duration = 22 sec
d	13,750	2,000 MSL	17244 Variable	180	2.3 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 15 sec
e	18,750	2,000 MSL	17244 Variable	210	3.1 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 88 sec
f	50,000	2,000 MSL	17941 Variable	210	8.2 NM, Angle = 7.9°, RoC/D = 2900 fpm, Duration = 61 sec
g	71,667	5,000 MSL	17244 Variable	210	11.8 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 362 sec
h	200,000	5,000 MSL	17244 Variable	210	32.9 NM, Angle = 0°, RoC/D = 0 fpm, Duration = N/A sec

NAS Jacksonville (22 ft MSL) Flight Profile P8D3 - Standard Departure
P-8 (Modeled as B-737-700*)
on Runway 10, Flight Track 10D2 - Departure to Warning Area

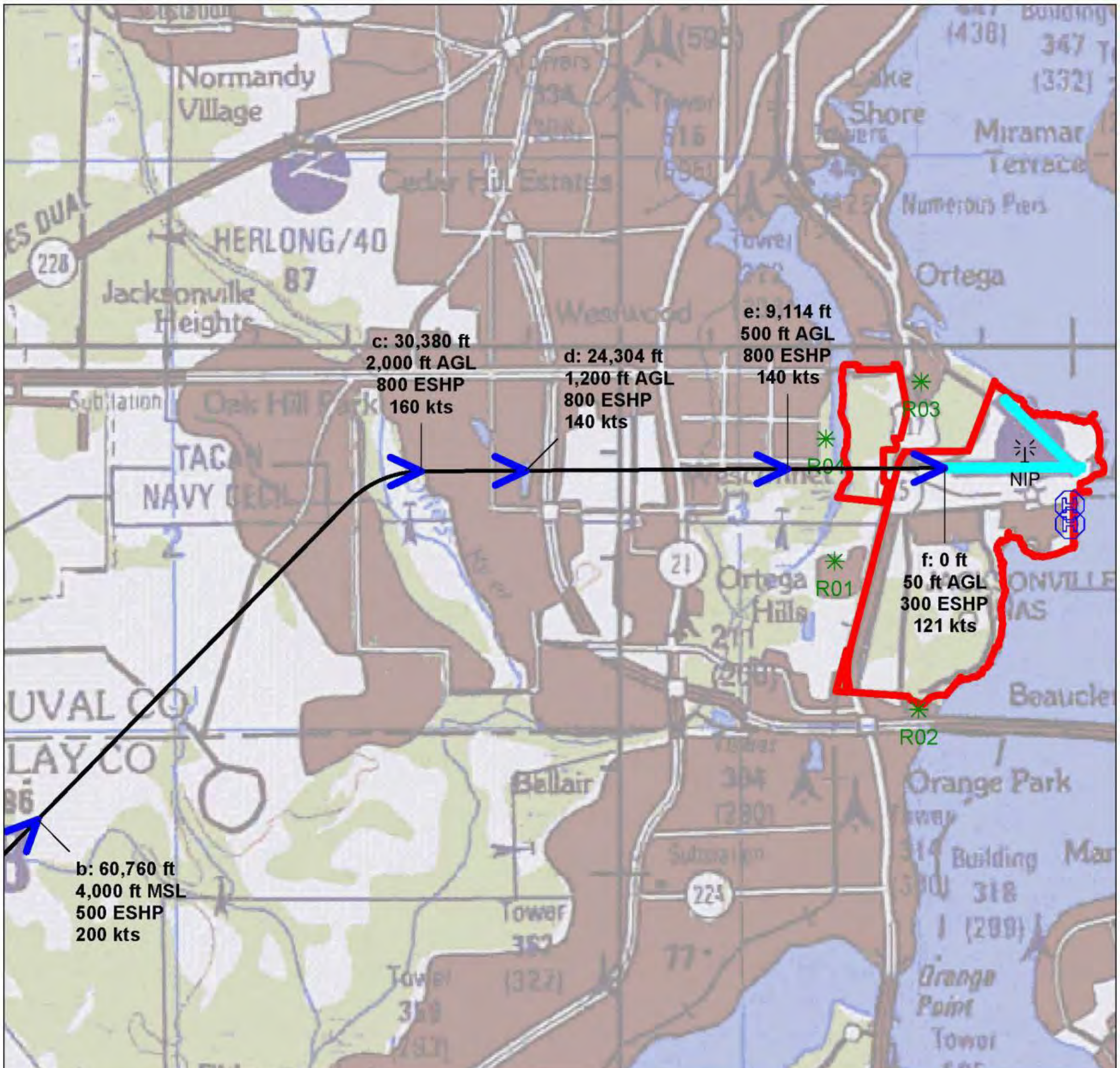
Departure, turn left/right to heading 170 and turn East heading 090 and climb to 5000K

P-8A Profiles by Dan Duquette, Mar07

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:130,000 (1 inch = 10,900 feet)

N



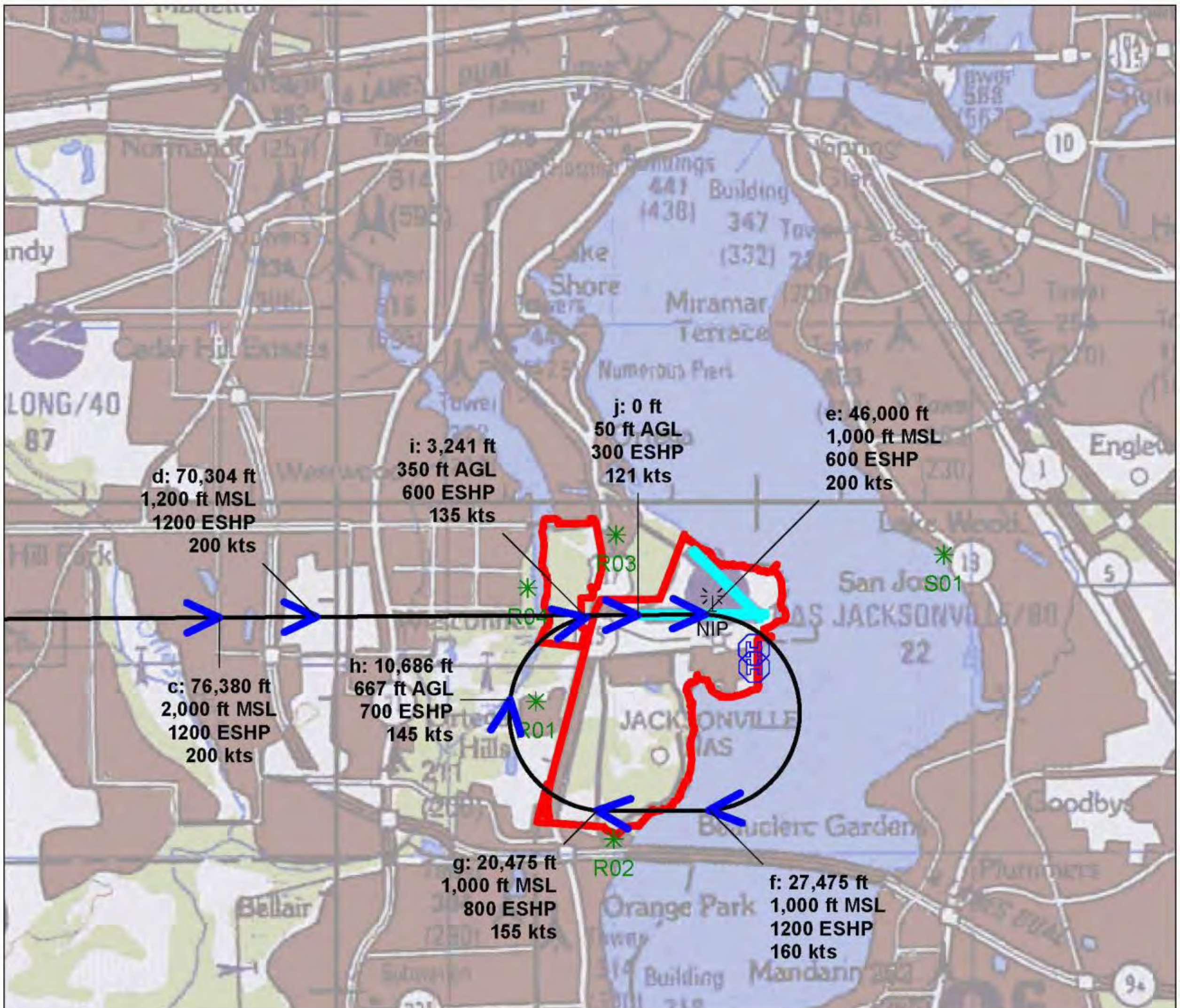
Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	185,000	4,000 MSL	1500 Variable	200	Angle = 0°, RoC/D = 0 fpm, Duration = 409 sec
b	60,760	4,000 MSL	500 Variable	200	Angle = -3.7°, RoC/D = -1000 fpm, Duration = 114 sec
c	30,380	2,000 AGL	800 Variable	160	Angle = -7.5°, RoC/D = -2000 fpm, Duration = 24 sec; begin final
d	24,304	1,200 AGL	800 Parallel	140	Angle = -2.6°, RoC/D = -700 fpm, Duration = 64 sec
e	9,114	500 AGL	800 Parallel	140	Angle = -2.8°, RoC/D = -700 fpm, Duration = 41 sec
f	0	50 AGL	300 Parallel	121	Angle = N/A°, RoC/D = N/A fpm, Duration = N/A sec

NAS Jacksonville (22 ft MSL) Flight Profile P3A1 - Standard Arrival Profile - Started approach 10NM out as per pilot interview Based P-3C on Runway 10, Flight Track 10A1 - VFR Arrival

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:119,000 (1 inch = 9,920 feet)

N

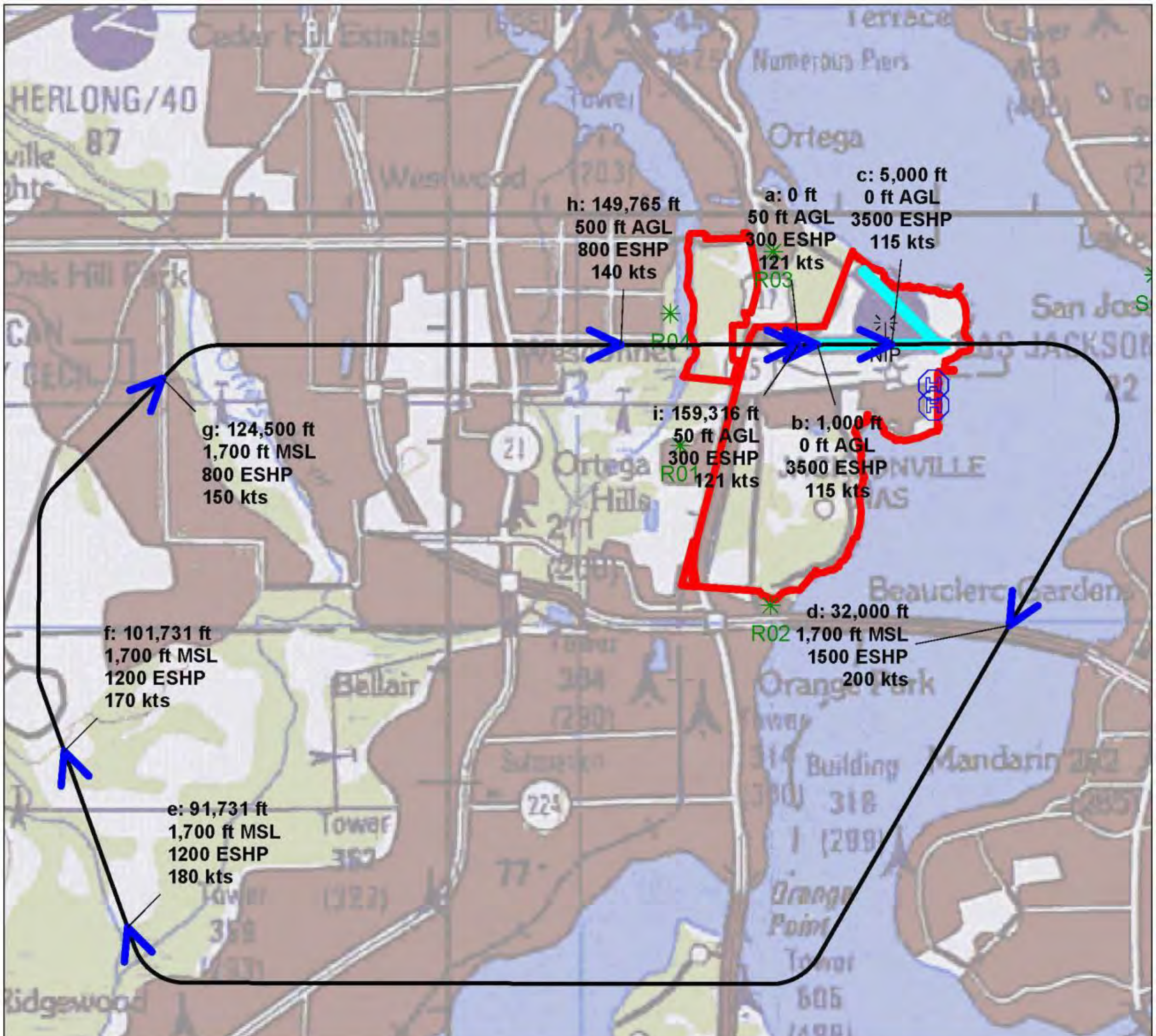


Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	200,000	4,000 MSL	1500 Variable	200	Angle = 0°, RoC/D = 0 fpm, Duration = 276 sec
b	106,760	4,000 MSL	1200 Variable	200	Angle = -3.8°, RoC/D = -1300 fpm, Duration = 90 sec
c	76,380	2,000 MSL	1200 Variable	200	Angle = -7.5°, RoC/D = -2600 fpm, Duration = 18 sec
d	70,304	1,200 MSL	1200 Variable	200	Angle = -0.5°, RoC/D = -200 fpm, Duration = 72 sec
e	46,000	1,000 MSL	600 Variable	200	Angle = 0°, RoC/D = 0 fpm, Duration = 61 sec
f	27,475	1,000 MSL	1200 Parallel	160	Angle = 0°, RoC/D = 0 fpm, Duration = 26 sec; gear down
g	20,475	1,000 MSL	800 Parallel	155	Angle = -1.8°, RoC/D = -500 fpm, Duration = 39 sec
h	10,686	667 AGL	700 Parallel	145	Angle = -2.4°, RoC/D = -600 fpm, Duration = 32 sec
i	3,241	350 AGL	600 Parallel	135	Angle = -5.3°, RoC/D = -1200 fpm, Duration = 15 sec
j	0	50 AGL	300 Parallel	121	Angle = N/A°, RoC/D = N/A fpm, Duration = N/A sec

NAS Jacksonville (22 ft MSL) Flight Profile P3O1 - Overhead Break Arrival - estimated based on vfr arr & touch and go 22oct07
Based P-3C
on Runway 10, Flight Track 10O2 - Overhead Break Arrival (2 NM Abeam, 1 NM Downwind, 0.33 NM Final)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:135,000 (1 inch = 11,300 feet)



Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	0	50 AGL	300 Parallel	121	Angle = -2.9°, RoC/D = -600 fpm, Duration = 5 sec
b	1,000	0 AGL	3500 Variable	115	Angle = 0°, RoC/D = 0 fpm, Duration = 21 sec
c	5,000	0 AGL	3500 Variable	115	Angle = 4.2°, RoC/D = 1200 fpm, Duration = 102 sec
d	32,000	1,700 MSL	1500 Variable	200	Angle = 0°, RoC/D = 0 fpm, Duration = 186 sec; reach pattern alt
e	91,731	1,700 MSL	1200 Variable	180	Angle = 0°, RoC/D = 0 fpm, Duration = 34 sec
f	101,731	1,700 MSL	1200 Variable	170	Angle = 0°, RoC/D = 0 fpm, Duration = 84 sec
g	124,500	1,700 MSL	800 Parallel	150	Angle = -3.3°, RoC/D = -900 fpm, Duration = 103 sec; gear down
h	149,765	500 AGL	800 Parallel	140	Angle = -2.7°, RoC/D = -600 fpm, Duration = 43 sec
i	159,316	50 AGL	300 Parallel	121	Angle = N/A°, RoC/D = N/A fpm, Duration = N/A sec

NAS Jacksonville (22 ft MSL) Flight Profile P3G1 - GCA Pattern Based P-3C on Runway 10, Flight Track 10G1 - GCA Box Pattern (5.4 NM Abeam, 5.18 NM Downwind, 5.13 NM Final)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:114,000 (1 inch = 9,490 feet)

N

Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	0	50 AGL	300 Parallel	121	Angle = -2.9°, RoC/D = -600 fpm, Duration = 5 sec
b	1,000	0 AGL	3500 Variable	115	Angle = 0°, RoC/D = 0 fpm, Duration = 21 sec
c	5,000	0 AGL	3500 Variable	115	Angle = 2.1°, RoC/D = 500 fpm, Duration = 47 sec
d	16,000	400 AGL	2500 Variable	160	Angle = 5.4°, RoC/D = 1500 fpm, Duration = 23 sec
e	22,095	1,000 MSL	1200 Parallel	160	Angle = 0°, RoC/D = 0 fpm, Duration = 55 sec; gear down
f	36,808	1,000 MSL	800 Parallel	155	Angle = -2.9°, RoC/D = -800 fpm, Duration = 24 sec; begin descent
g	42,930	667 AGL	700 Parallel	145	Angle = -2.4°, RoC/D = -600 fpm, Duration = 32 sec
h	50,375	350 AGL	600 Parallel	135	Angle = -5.3°, RoC/D = -1200 fpm, Duration = 15 sec; begin final
i	53,616	50 AGL	300 Parallel	121	Angle = N/A°, RoC/D = N/A fpm, Duration = N/A sec

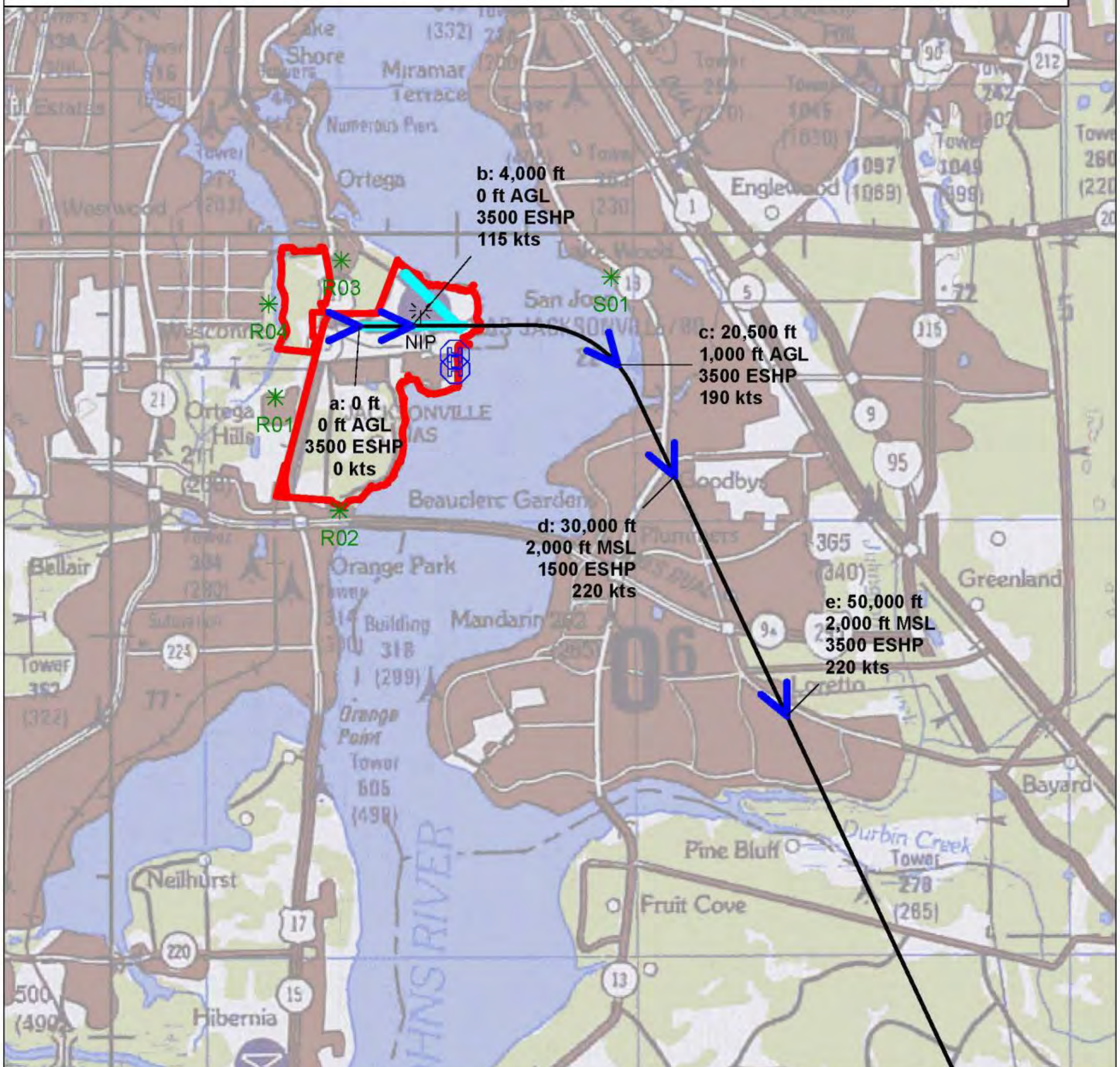
NAS Jacksonville (22 ft MSL) Flight Profile P3T1 - Touch & Go Pattern Based P-3C
on Runway 10, Flight Track 10T2 - Touch and Go Pattern (1.25 NM Abeam, 2.4 NM Downwind, 0.75 NM Final)
1.25 NM Abeam, 2.45 NM Downwind, 0.8 NM Final

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000

Scale in Feet 1:44,000 (1 inch = 3,670 feet)

N

Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	0	0 AGL	3500 Variable	0	0 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 41 sec
b	4,000	0 AGL	3500 Variable	115	0.7 NM, Angle = 3.5°, RoC/D = 900 fpm, Duration = 64 sec
c	20,500	1,000 AGL	3500 Variable	190	3.4 NM, Angle = 5.9°, RoC/D = 2100 fpm, Duration = 27 sec
d	30,000	2,000 MSL	1500 Variable	220	4.9 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 54 sec
e	50,000	2,000 MSL	3500 Variable	220	8.2 NM, Angle = 3.1°, RoC/D = 1200 fpm, Duration = 404 sec
f	200,000	10,000 MSL	3500 Variable	220	32.9 NM, Angle = 0°, RoC/D = 0 fpm, Duration = N/A sec

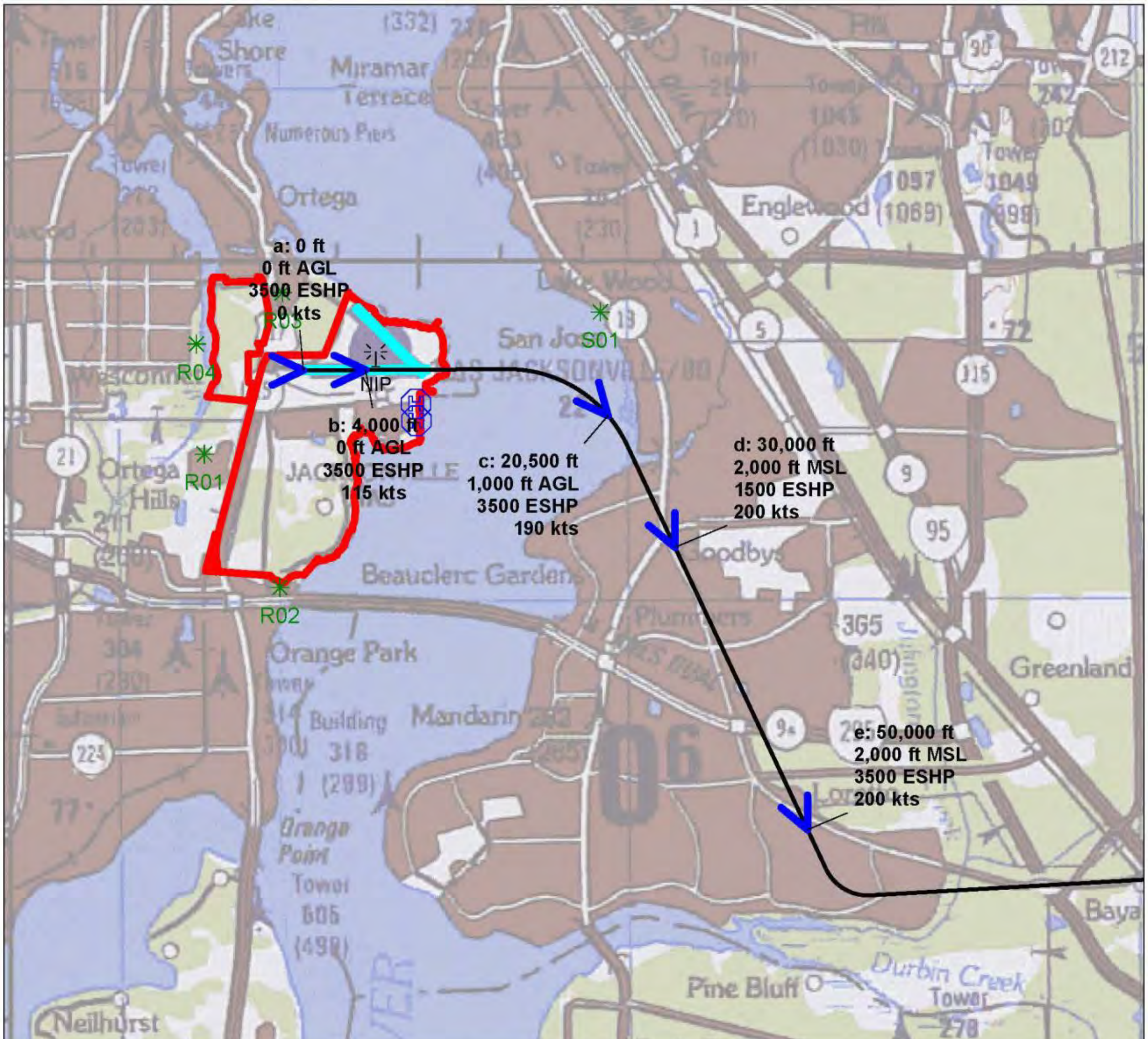


NAS Jacksonville (22 ft MSL) Flight Profile P3D1 - Standard Departure
Based P-3C
on Runway 10, Flight Track 10D1 - Departure Heading 160
Prior to brake release, aircraft sits at 3500 ESHP Variable for 1 sec

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:156,000 (1 inch = 13,000 feet)

N



Point	Distance ft	Height ft	Power ESHP	Speed kts	Notes
a	0	0 AGL	3500 Variable	0	0 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 41 sec
b	4,000	0 AGL	3500 Variable	115	0.7 NM, Angle = 3.5°, RoC/D = 900 fpm, Duration = 64 sec
c	20,500	1,000 AGL	3500 Variable	190	3.4 NM, Angle = 5.9°, RoC/D = 2000 fpm, Duration = 29 sec
d	30,000	2,000 MSL	1500 Variable	200	4.9 NM, Angle = 0°, RoC/D = 0 fpm, Duration = 59 sec
e	50,000	2,000 MSL	3500 Variable	200	8.2 NM, Angle = 1.1°, RoC/D = 400 fpm, Duration = 444 sec
f	200,000	5,000 MSL	1500 Variable	200	32.9 NM, Angle = 0°, RoC/D = 0 fpm, Duration = N/A sec

NAS Jacksonville (22 ft MSL) Flight Profile P3D3 - Standard Departure
Based P-3C
on Runway 10, Flight Track 10D2 - Departure to Warning Area

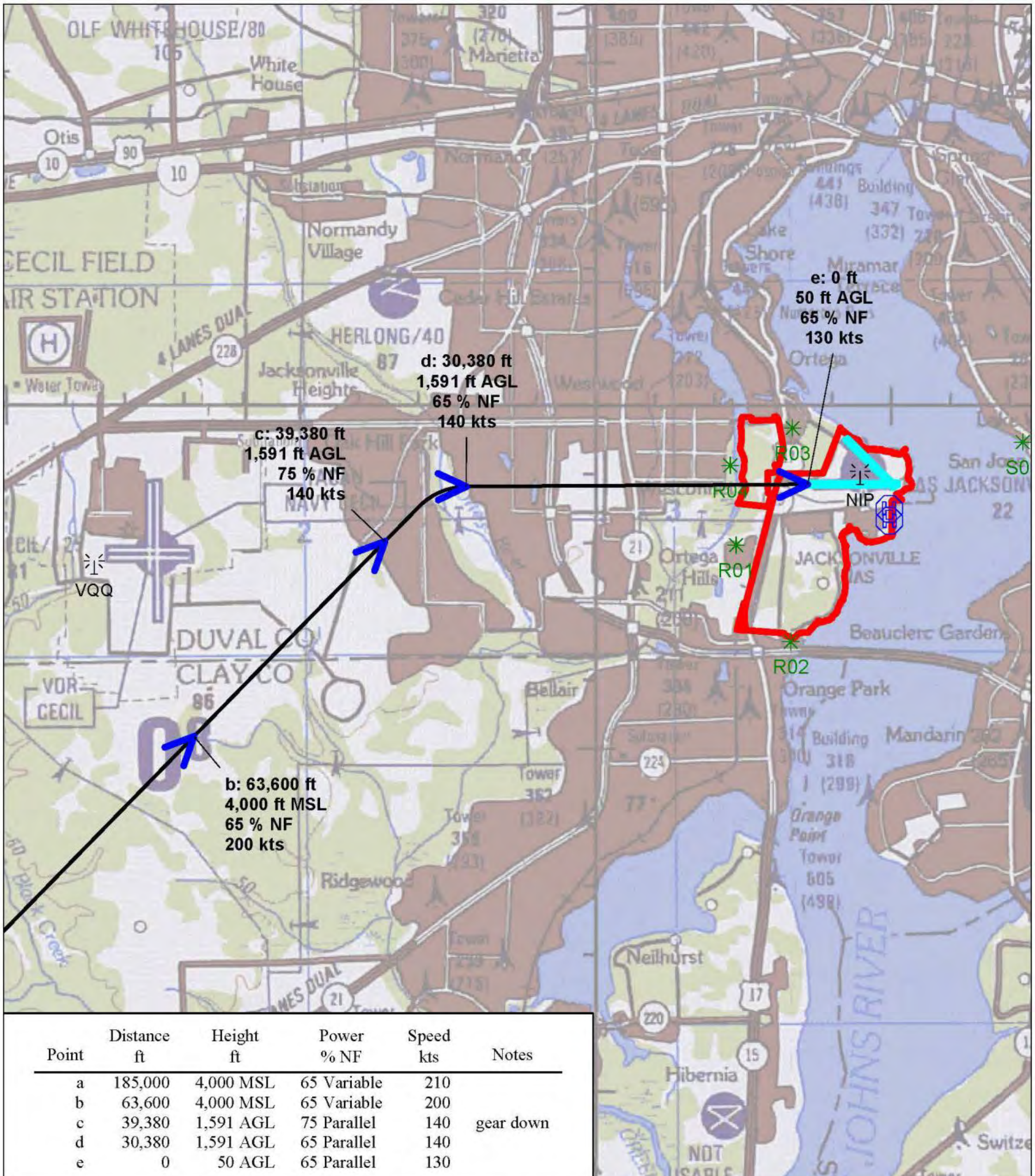
Turn to heading 160 then turn East heading 090 and climb to 5000K; Speed change from 220 to 200 as per pilot interview

Prior to brake release, aircraft sits at 3500 ESHP Variable for 1 sec

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:136,000 (1 inch = 11,300 feet)

N



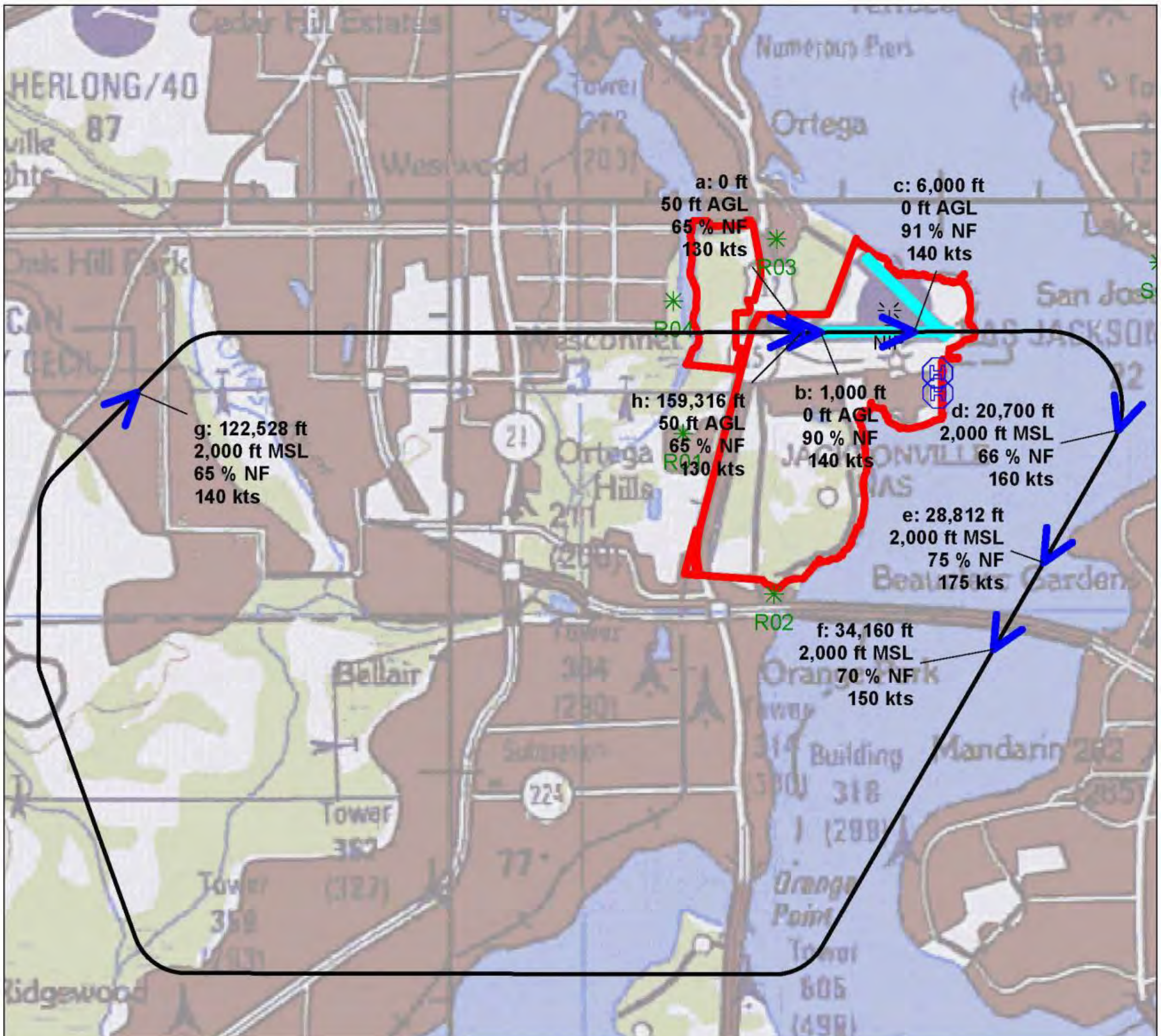
Point	Distance ft	Height ft	Power % NF	Speed kts	Notes
a	185,000	4,000 MSL	65 Variable	210	
b	63,600	4,000 MSL	65 Variable	200	
c	39,380	1,591 AGL	75 Parallel	140	gear down
d	30,380	1,591 AGL	65 Parallel	140	
e	0	50 AGL	65 Parallel	130	

NAS Jacksonville (22 ft MSL) Flight Profile C5A1 - Standard Arrival
Transient C-5A
on Runway 10, Flight Track 10A1 - VFR Arrival
WR 03-19 Appx B

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:169,000 (1 inch = 14,100 feet)

N



Point	Distance ft	Height ft	Power % NF	Speed kts	Notes
a	0	50 AGL	65 Parallel	130	-2.9° , -700 fpm, 4 sec. threshold crossing, gear down
b	1,000	0 AGL	90 Variable	140	+0° , +0 fpm, 21 sec
c	6,000	0 AGL	91 Variable	140	+7.7° , +2000 fpm, 58 sec
d	20,700	2,000 MSL	66 Variable	160	+0° , +0 fpm, 29 sec. reach pattern altitude
e	28,812	2,000 MSL	75 Parallel	175	+0° , +0 fpm, 19 sec. gear down
f	34,160	2,000 MSL	70 Parallel	150	+0° , +0 fpm, 384 sec
g	122,528	2,000 MSL	65 Parallel	140	-3° , -700 fpm, 161 sec. 3 deg glide slope intercept; begin descent
h	159,316	50 AGL	65 Parallel	130	

NAS Jacksonville (22 ft MSL) Flight Profile C5G1 - GCA Pattern - NEW PROFILE
Transient C-5A
on Runway 10, Flight Track 10G1 - GCA Box Pattern (5.4 NM Abeam, 5.18 NM Downwind, 5.13 NM Final)
Source of profile is MCBH Kaneohe Bay, adjusted to Jax course rules

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:114,000 (1 inch = 9,490 feet)

N

Point	Distance ft	Height ft	Power % NF	Speed kts	Notes
a	0	50 AGL	65 Parallel	130	
b	1,200	0 AGL	90 Variable	130	
c	6,000	0 AGL	91 Variable	140	
d	11,333	1,000 MSL	66 Variable	175	reach pattern altitude
e	36,520	1,000 MSL	75 Parallel	175	end downwind
f	42,747	1,000 MSL	70 Parallel	150	begin descent
g	48,909	523 AGL	65 Parallel	140	begin final
h	53,616	50 AGL	65 Parallel	130	

NAS Jacksonville (22 ft MSL) Flight Profile C5T1 - Touch and Go Transient C-5A on Runway 10, Flight Track 10T2 - Touch and Go Pattern (1.25 NM Abeam, 2.4 NM Downwind, 0.75 NM Final)

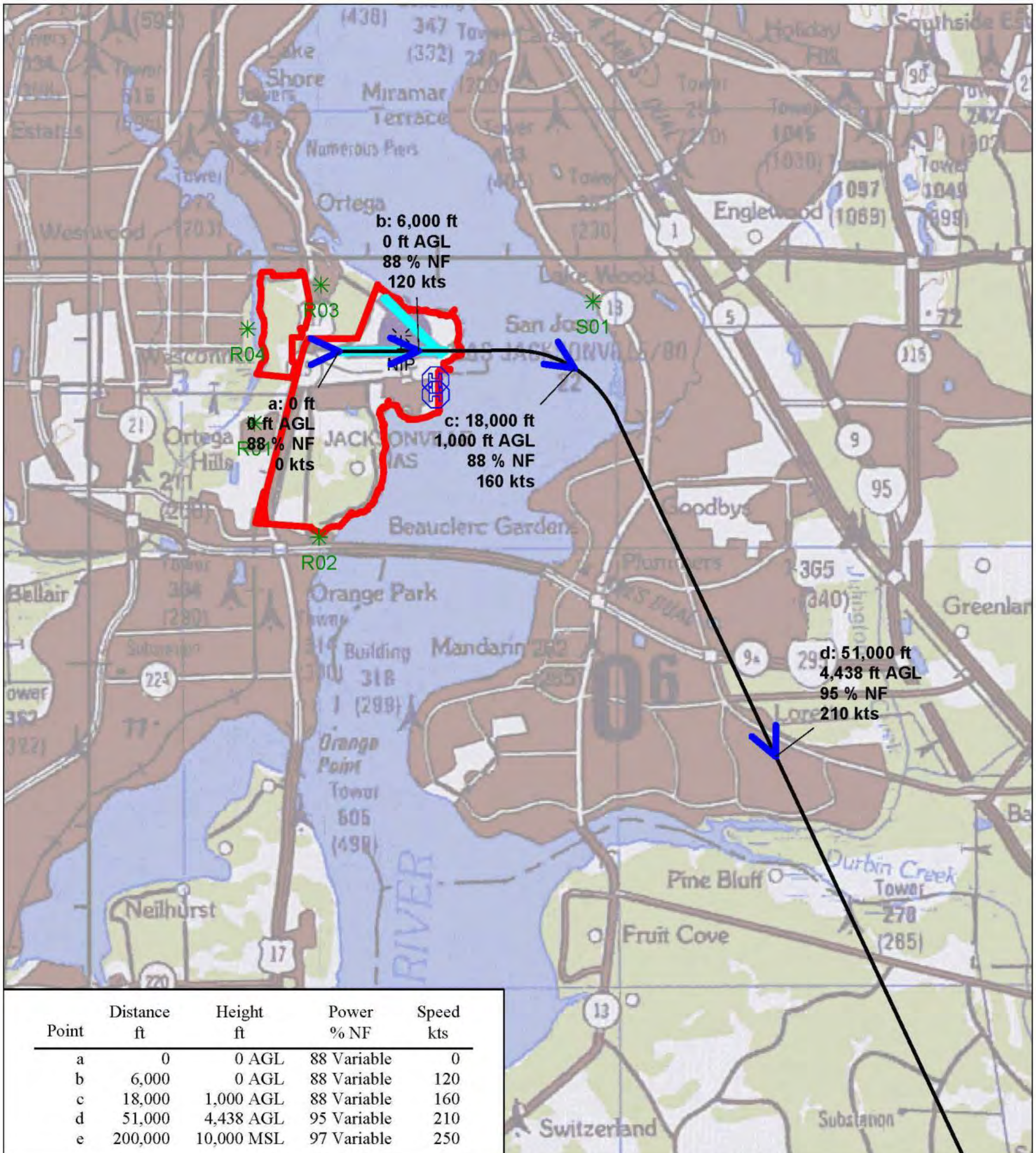
WR 03-19 Appx B

1.25 NM Abeam, 2.45 NM Downwind, 0.8 NM Final

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000

Scale in Feet 1:44,000 (1 inch = 3,670 feet)

N



Point	Distance ft	Height ft	Power % NF	Speed kts
a	0	0 AGL	88 Variable	0
b	6,000	0 AGL	88 Variable	120
c	18,000	1,000 AGL	88 Variable	160
d	51,000	4,438 AGL	95 Variable	210
e	200,000	10,000 MSL	97 Variable	250

NAS Jacksonville (22 ft MSL) Flight Profile C5D1 - Standard Departure
Transient C-5A
on Runway 10, Flight Track 10D1 - Departure Heading 160

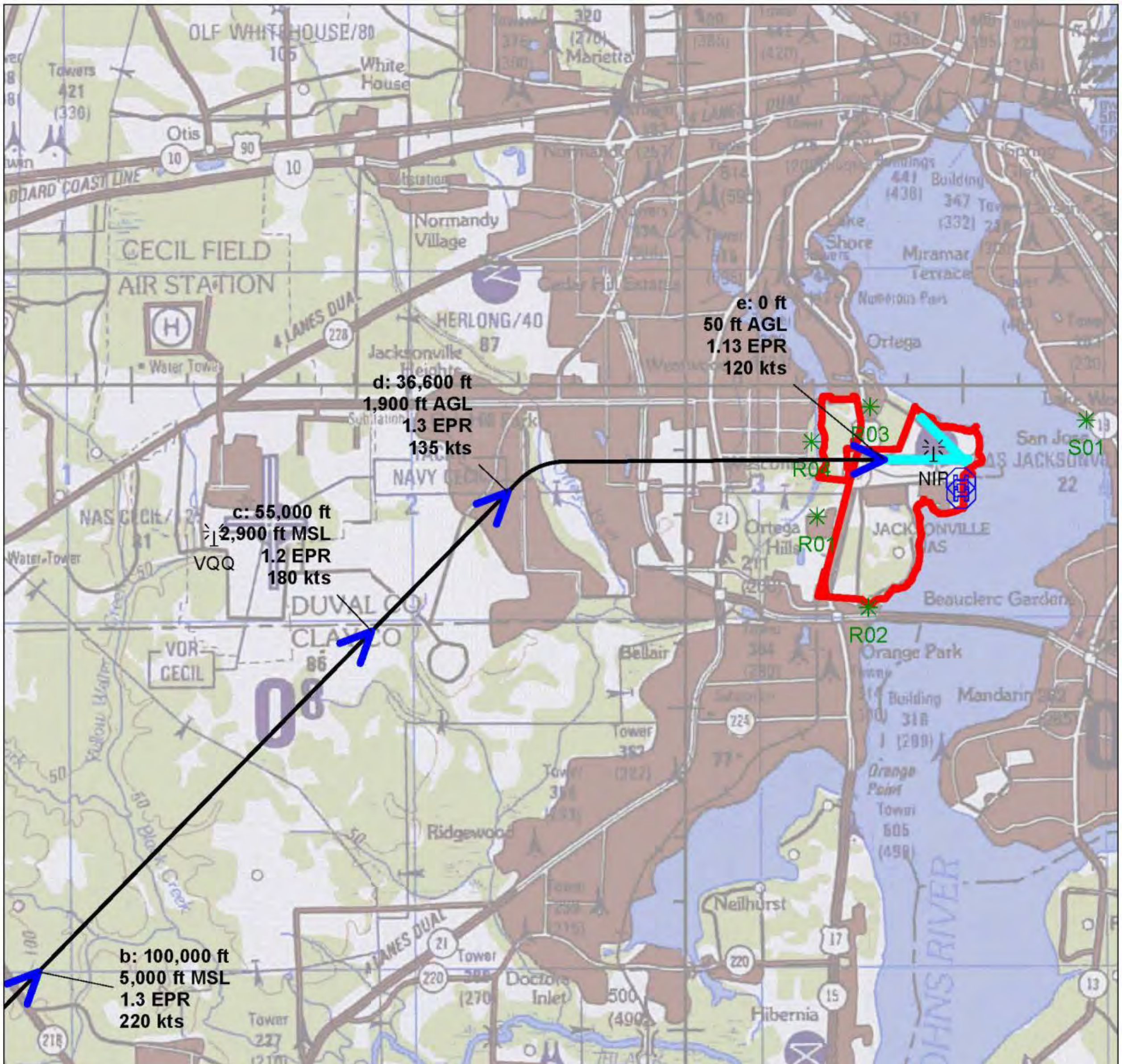
WR 03-19 Appx B

Prior to brake release, aircraft sits at 88 % NF Variable for 1 sec

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:143,000 (1 inch = 11,900 feet)

N

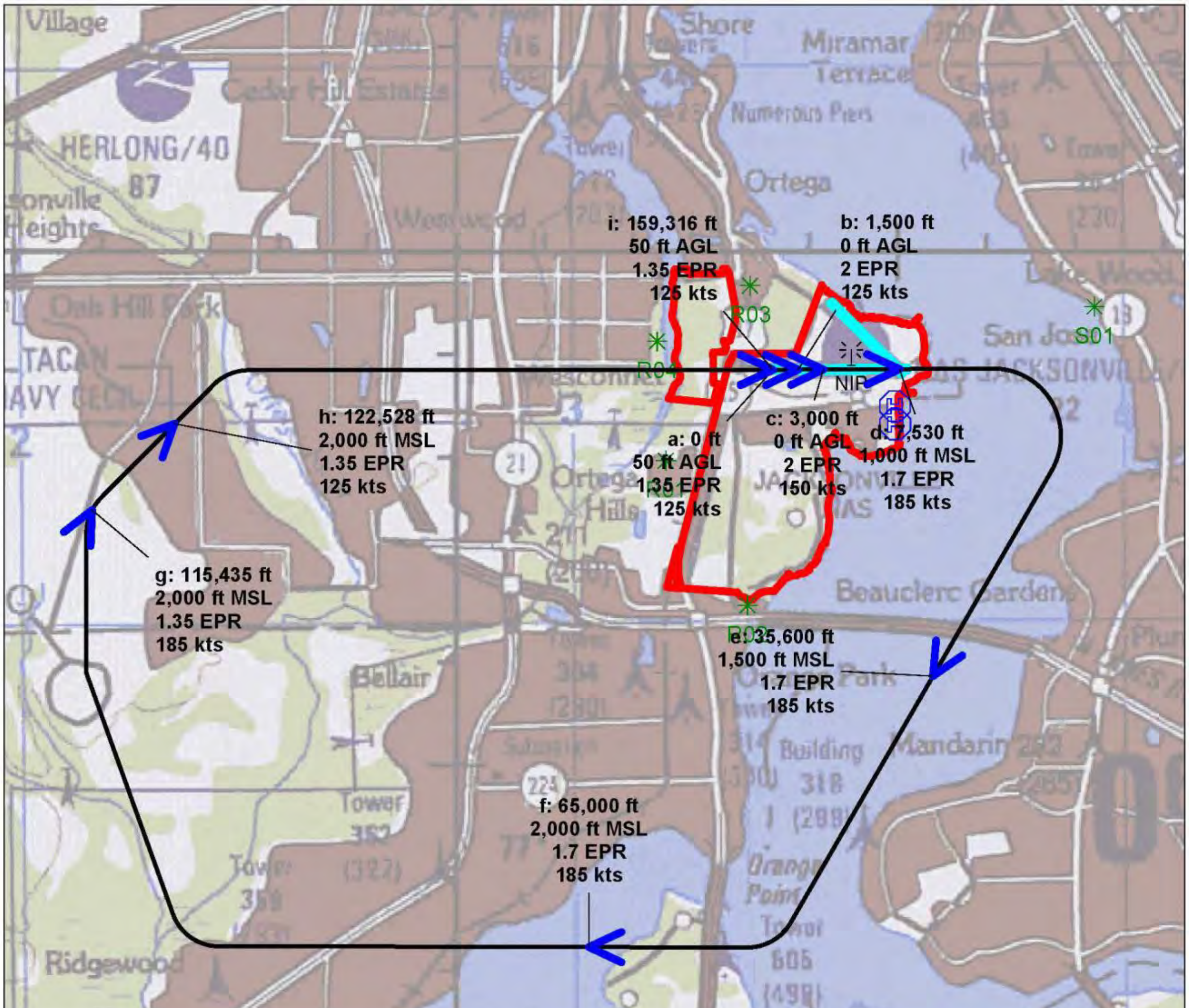


Point	Distance ft	Height ft	Power EPR	Speed kts	Notes
a	200,000	10,000 MSL	1.3 Variable	250	-2.9° , -1200 fpm, 252 sec
b	100,000	5,000 MSL	1.3 Variable	220	-2.7° , -900 fpm, 133 sec
c	55,000	2,900 MSL	1.2 Variable	180	-3° , -800 fpm, 69 sec
d	36,600	1,900 AGL	1.3 Variable	135	-2.9° , -700 fpm, 170 sec
e	0	50 AGL	1.13 Variable	120	

NAS Jacksonville (22 ft MSL) Flight Profile C9A1 - Standard Arrival - NEW PROFILE
Transient C-9A
on Runway 10, Flight Track 10A1 - VFR Arrival
Source of profile is NAS Whidbey Island, adjusted to Jax course rules

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:195,000 (1 inch = 16,200 feet)



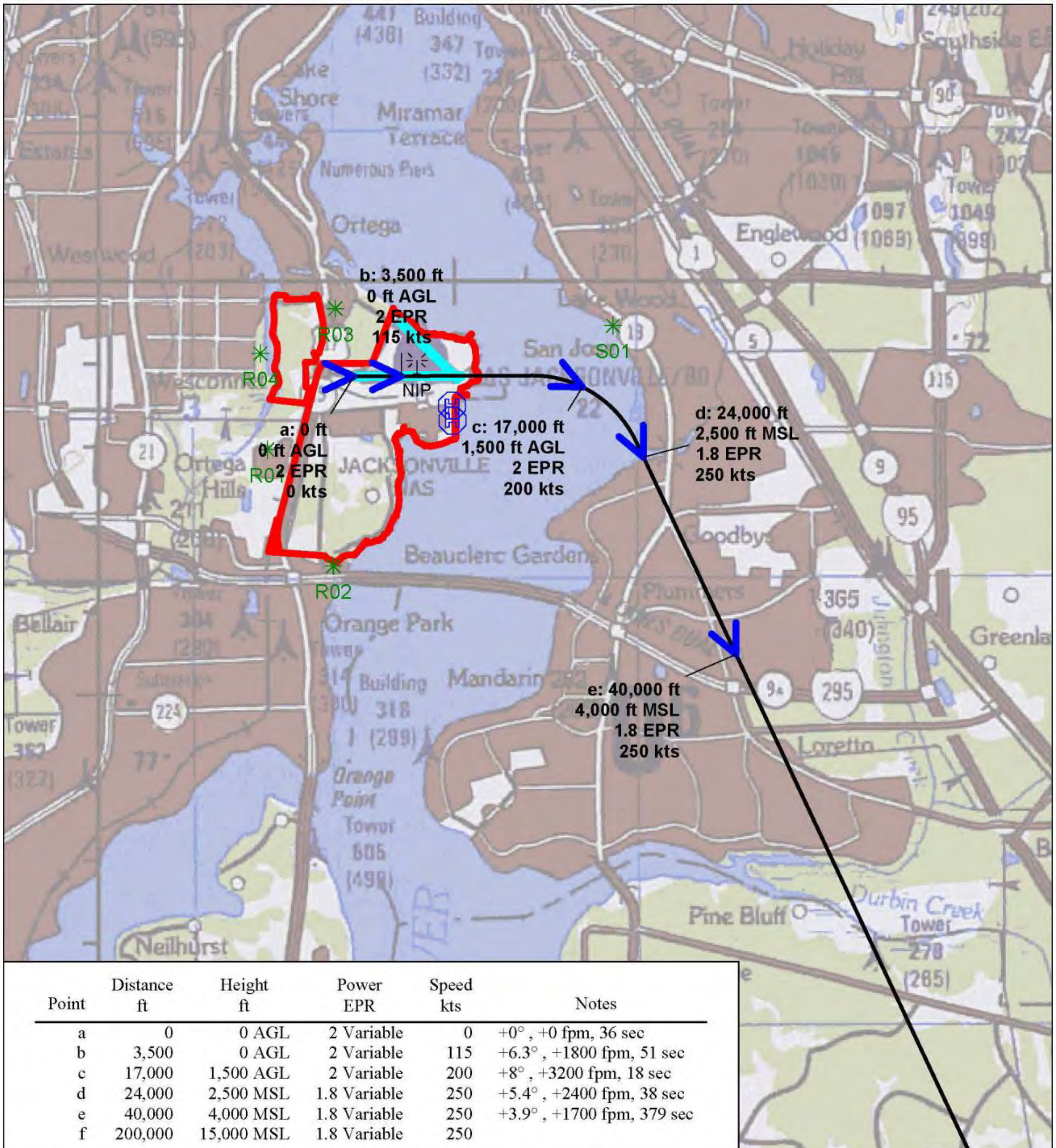
Point	Distance ft	Height ft	Power EPR	Speed kts	Notes
a	0	50 AGL	1.35 Parallel	125	-1.9° , -400 fpm, 7 sec
b	1,500	0 AGL	2 Variable	125	+0° , +0 fpm, 6 sec
c	3,000	0 AGL	2 Variable	150	+12.2° , +3600 fpm, 16 sec
d	7,530	1,000 MSL	1.7 Variable	185	+1° , +300 fpm, 90 sec
e	35,600	1,500 MSL	1.7 Variable	185	+1° , +300 fpm, 94 sec
f	65,000	2,000 MSL	1.7 Variable	185	+0° , +0 fpm, 162 sec. reach pattern altitude
g	115,435	2,000 MSL	1.35 Variable	185	+0° , +0 fpm, 27 sec. gear down
h	122,528	2,000 MSL	1.35 Parallel	125	-3° , -700 fpm, 174 sec; 3 deg glide slope intercept
i	159,316	50 AGL	1.35 Parallel	125	threshold crossing

NAS Jacksonville (22 ft MSL) Flight Profile C9G1 - GCA Box Pattern - NEW PROFILE
Transient C-9A
on Runway 10, Flight Track 10G1 - GCA Box Pattern (5.4 NM Abeam, 5.18 NM Downwind, 5.13 NM Final)
Source of profile is NBVC Point Mugu, adjusted to Jax course rules

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:130,000 (1 inch = 10,800 feet)

N



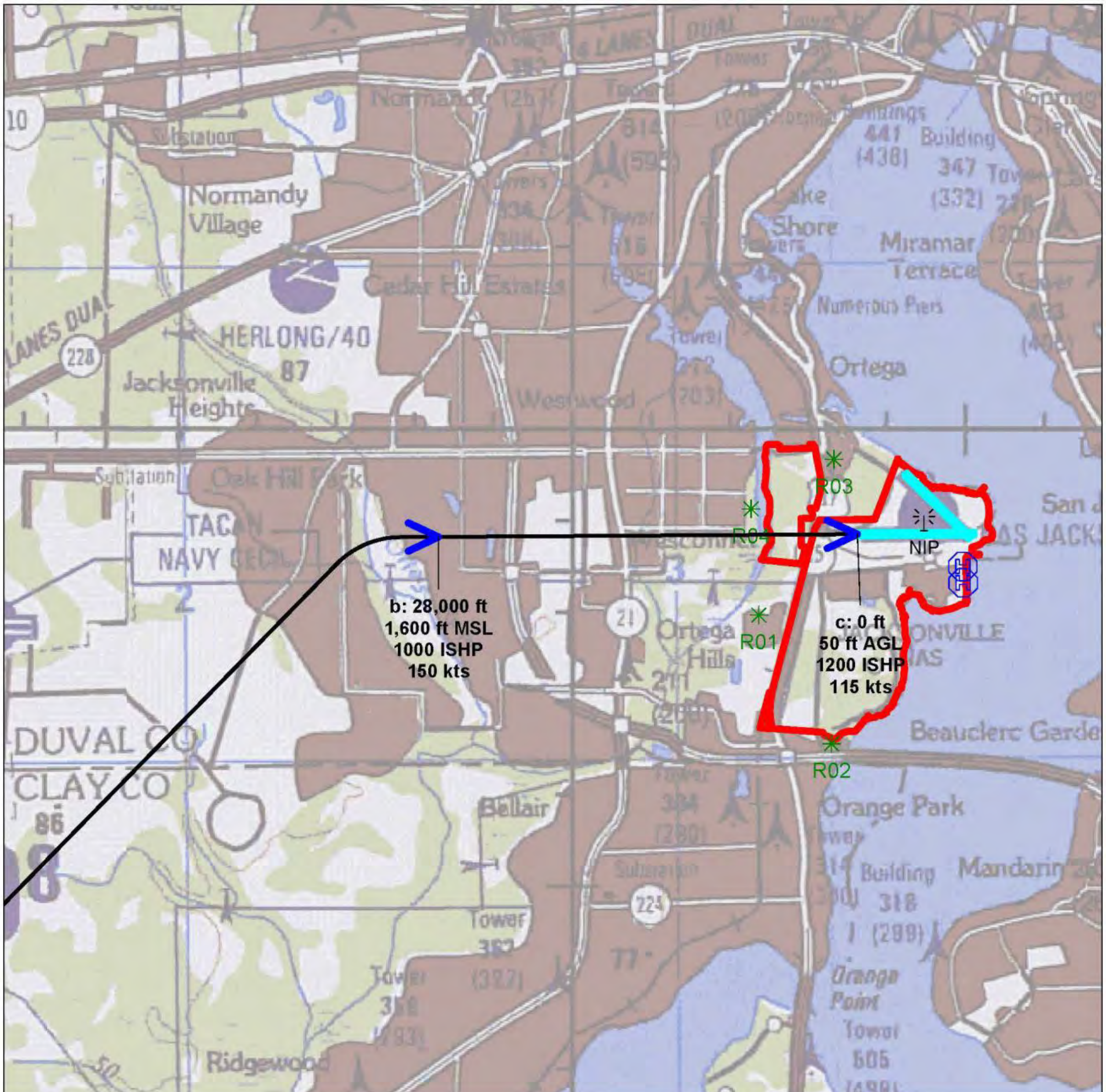
Point	Distance ft	Height ft	Power EPR	Speed kts	Notes
a	0	0 AGL	2 Variable	0	+0° , +0 fpm, 36 sec
b	3,500	0 AGL	2 Variable	115	+6.3° , +1800 fpm, 51 sec
c	17,000	1,500 AGL	2 Variable	200	+8° , +3200 fpm, 18 sec
d	24,000	2,500 MSL	1.8 Variable	250	+5.4° , +2400 fpm, 38 sec
e	40,000	4,000 MSL	1.8 Variable	250	+3.9° , +1700 fpm, 379 sec
f	200,000	15,000 MSL	1.8 Variable	250	

NAS Jacksonville (22 ft MSL) Flight Profile C9D1 - Standard Departure - NEW PROFILE
Transient C-9A
on Runway 10, Flight Track 10D1 - Departure Heading 160
Source of profile is NAS Whidbey Island, adjusted to Jax course rules
Prior to brake release, aircraft sits at 2 EPR Variable for 1 sec

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:143,000 (1 inch = 11,900 feet)

N



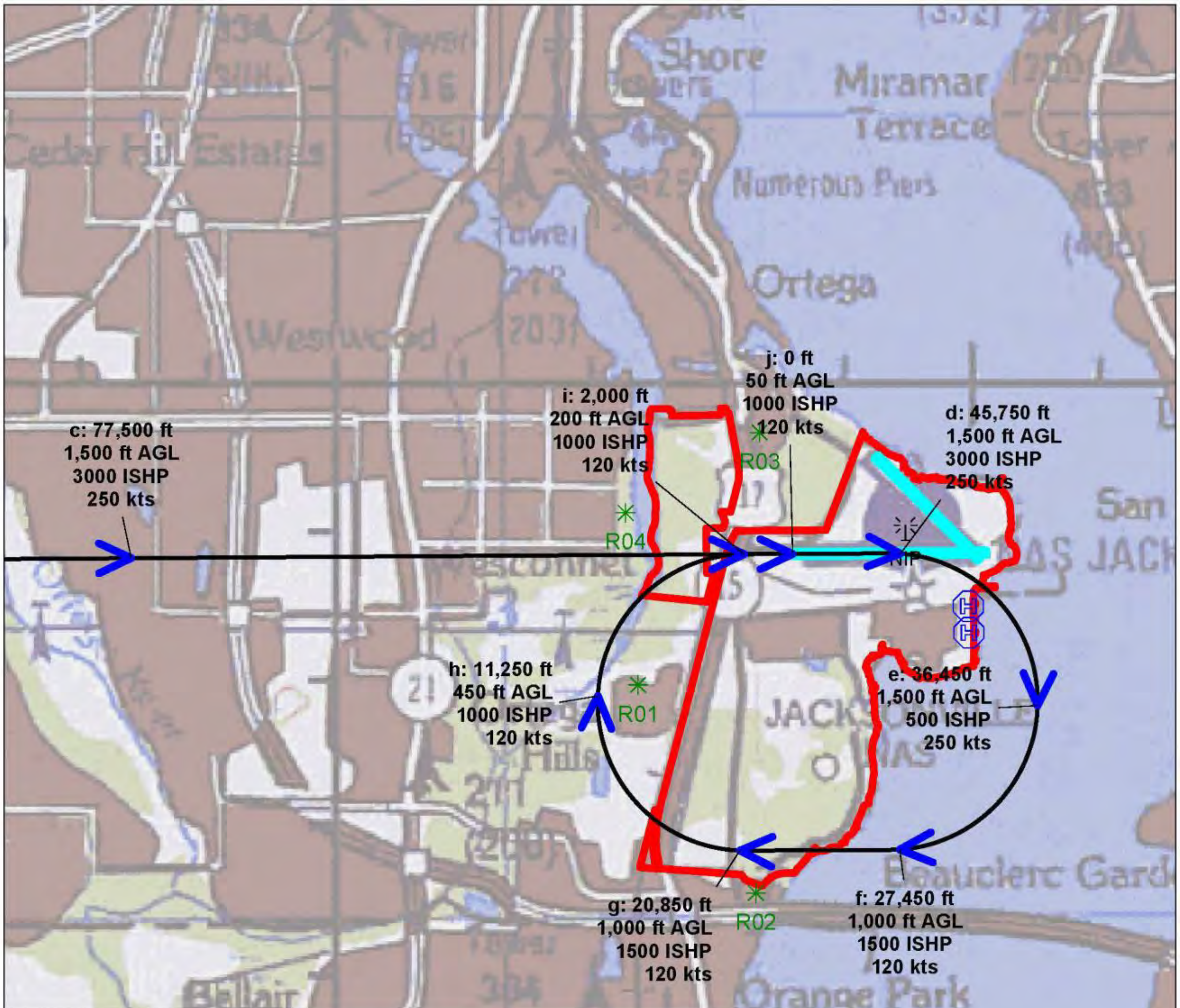
Point	Distance ft	Height ft	Power ISHP	Speed kts	Notes
a	200,000	2,000 MSL	3000 Variable	250	-0.1° , +0 fpm, 510 sec
b	28,000	1,600 MSL	1000 Approach	150	-3.1° , -700 fpm, 125 sec. gear down, catch 3 deg glide slope
c	0	50 AGL	1200 Approach	115	

NAS Jacksonville (22 ft MSL) Flight Profile E2A1 - Standard Arrival - NEW PROFILE
Based E-2C
on Runway 10, Flight Track 10A1 - VFR Arrival
Source of profile is NBVC Point Mugu, adjusted to Jax course rules

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:135,000 (1 inch = 11,300 feet)

N



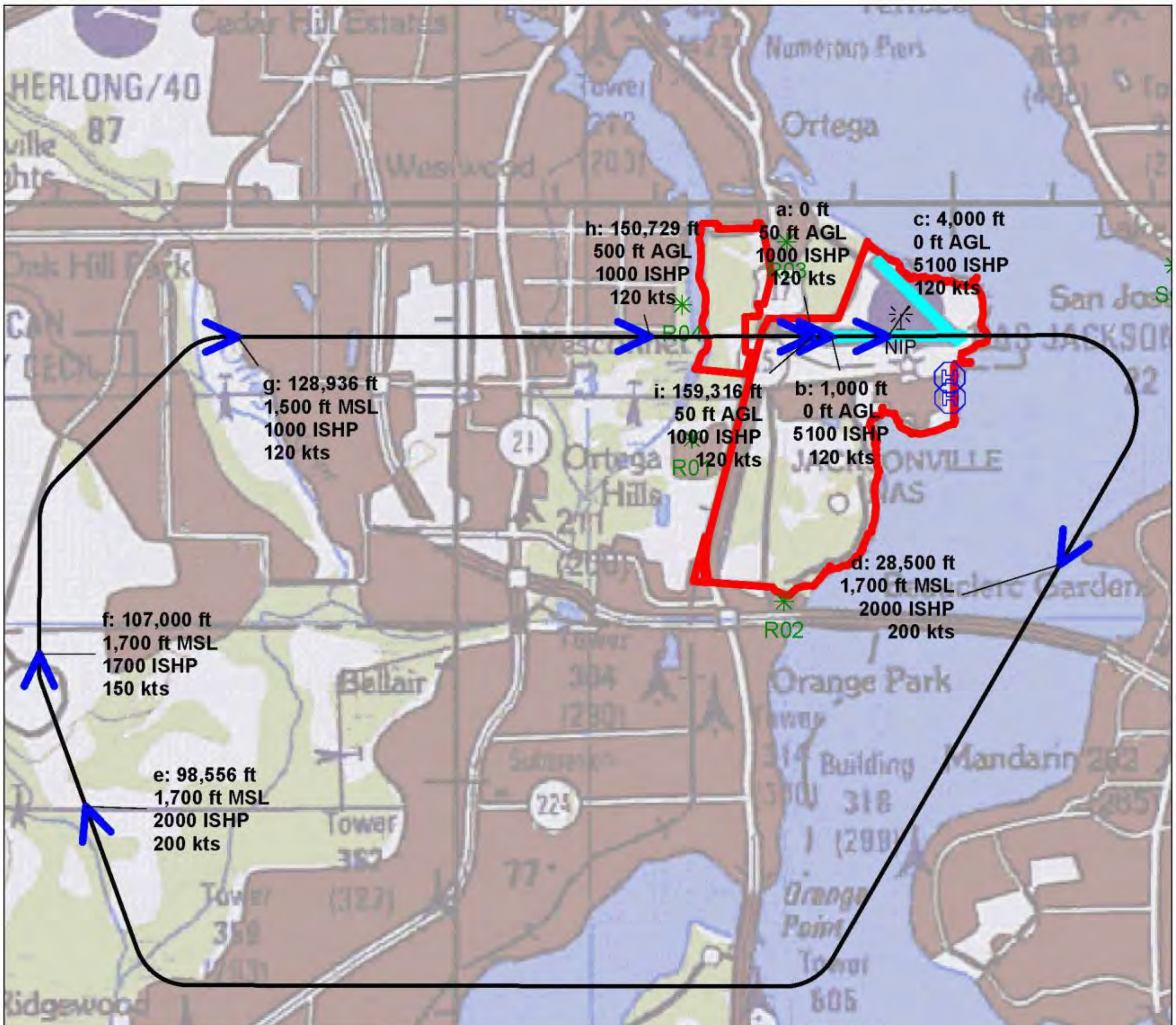
Point	Distance ft	Height ft	Power ISHP	Speed kts	Notes
a	200,000	2,000 MSL	3000 Variable	250	+0° , +0 fpm, 258 sec
b	91,140	2,000 MSL	3000 Variable	250	-2° , -900 fpm, 32 sec
c	77,500	1,500 AGL	3000 Variable	250	+0° , +0 fpm, 75 sec
d	45,750	1,500 AGL	3000 Variable	250	+0° , +0 fpm, 22 sec
e	36,450	1,500 AGL	500 Variable	250	-3.2° , -1000 fpm, 29 sec
f	27,450	1,000 AGL	1500 Variable	120	+0° , +0 fpm, 33 sec
g	20,850	1,000 AGL	1500 Parallel	120	-3.3° , -700 fpm, 47 sec
h	11,250	450 AGL	1000 Parallel	120	-1.5° , -300 fpm, 46 sec
i	2,000	200 AGL	1000 Parallel	120	-4.3° , -900 fpm, 10 sec
j	0	50 AGL	1000 Parallel	120	

NAS Jacksonville (22 ft MSL) Flight Profile E2O1 - Overhead Break Arrival Based E-2C
on Runway 10, Flight Track 10O2 - Overhead Break Arrival (2 NM Abeam, 1 NM Downwind, 0.33 NM Final)
Profile modeled in EIS

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000

Scale in Feet 1:89,200 (1 inch = 7,440 feet)

N



Point	Distance ft	Height ft	Power ISHP	Speed kts	Notes
a	0	50 AGL	1000 Parallel	120	-2.9° , -600 fpm, 5 sec
b	1,000	0 AGL	5100 Parallel	120	+0° , +0 fpm, 15 sec
c	4,000	0 AGL	5100 Parallel	120	+4.6° , +1300 fpm, 91 sec
d	28,500	1,700 MSL	2000 Variable	200	+0° , +0 fpm, 208 sec
e	98,556	1,700 MSL	2000 Variable	200	+0° , +0 fpm, 73 sec
f	107,000	1,700 MSL	1700 Variable	150	-1.3° , -300 fpm, 96 sec
g	128,936	1,500 MSL	1000 Variable	120	-2.6° , -500 fpm, 108 sec
h	150,729	500 AGL	1000 Parallel	120	-3° , -600 fpm, 42 sec; gear down
i	159,316	50 AGL	1000 Parallel	120	

NAS Jacksonville (22 ft MSL) Flight Profile E2G2 - GCA Pattern - NEW PROFILE Based E-2C
on Runway 10, Flight Track 10G1 - GCA Box Pattern (5.4 NM Abeam, 5.18 NM Downwind, 5.13 NM Final)
Profile from EIS analysis, although not used (zero E-2 GCA operations in EIS)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000

Scale in Feet 1:114,000 (1 inch = 9,490 feet)

N

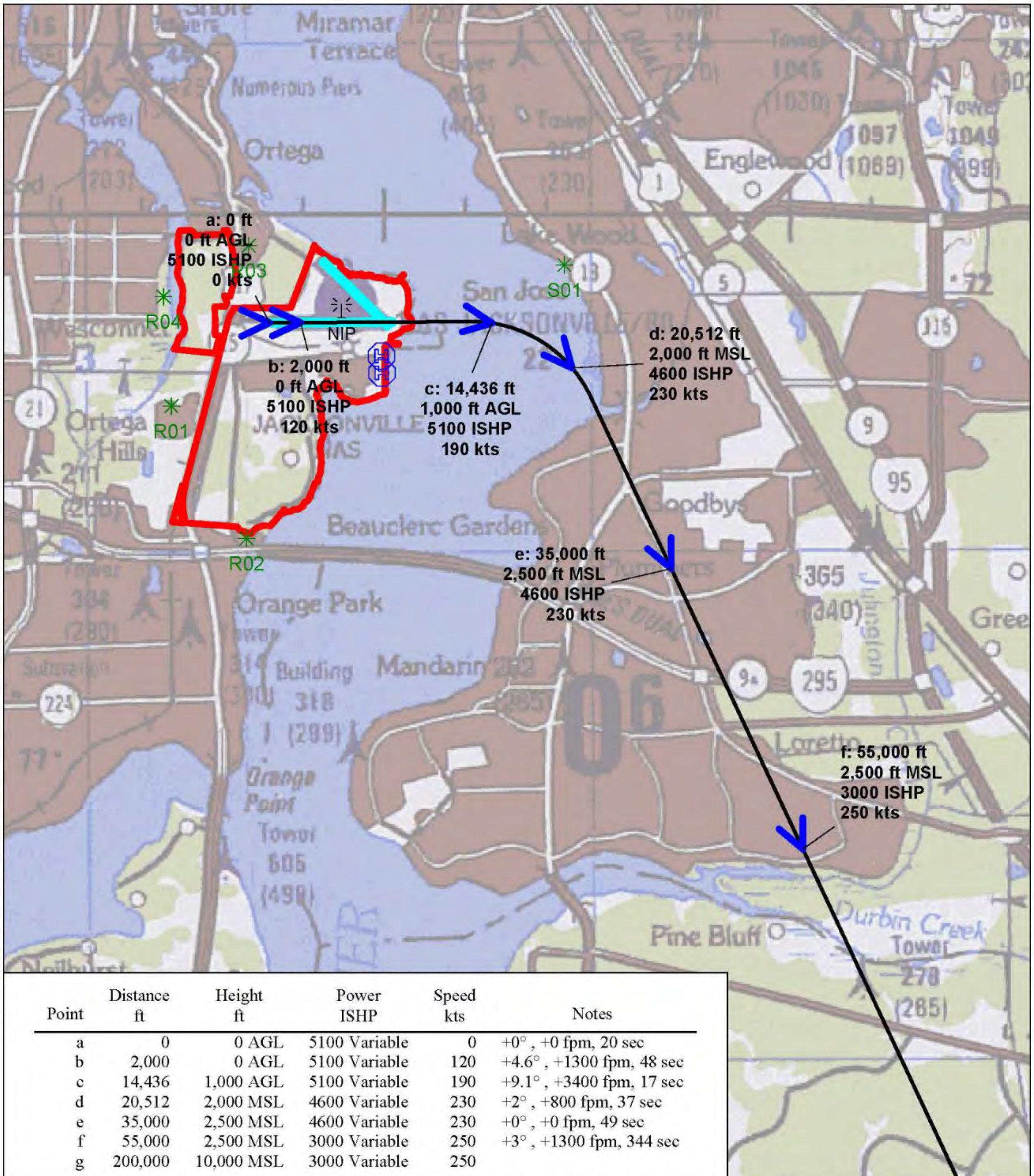
Point	Distance ft	Height ft	Power ISHP	Speed kts	Notes
a	0	50 AGL	1000 Parallel	120	-2.9° , -600 fpm, 5 sec
b	1,000	0 AGL	5100 Parallel	120	+0° , +0 fpm, 2 sec
c	1,500	0 AGL	5100 Parallel	120	+6.3° , +1500 fpm, 39 sec
d	10,350	1,000 MSL	2000 Parallel	150	+0° , +0 fpm, 41 sec
e	20,750	1,000 MSL	2000 Parallel	150	+0° , +0 fpm, 25 sec
f	26,725	1,000 MSL	500 Parallel	135	+0° , +0 fpm, 28 sec
g	32,700	1,000 MSL	1000 Parallel	120	-5.7° , -1200 fpm, 26 sec
h	37,950	450 AGL	1000 Parallel	120	-3.3° , -700 fpm, 35 sec
i	44,991	50 AGL	1000 Parallel	120	

NAS Jacksonville (22 ft MSL) Flight Profile E2T1 - Touch & Go
Based E-2C
on Runway 10, Flight Track 10T1 - Touch and Go Pattern (1.2 NM Abeam, 1.9 NM Downwind, 0.25 NM Final)
Profile modeled in EIS
1.15 NM Abeam, 2 NM Downwind, 0.3 NM Final

0 2,000 4,000 6,000 8,000 10,000

Scale in Feet 1:36,300 (1 inch = 3,030 feet)

N



Point	Distance ft	Height ft	Power ISHP	Speed kts	Notes
a	0	0 AGL	5100 Variable	0	+0° , +0 fpm, 20 sec
b	2,000	0 AGL	5100 Variable	120	+4.6° , +1300 fpm, 48 sec
c	14,436	1,000 AGL	5100 Variable	190	+9.1° , +3400 fpm, 17 sec
d	20,512	2,000 MSL	4600 Variable	230	+2° , +800 fpm, 37 sec
e	35,000	2,500 MSL	4600 Variable	230	+0° , +0 fpm, 49 sec
f	55,000	2,500 MSL	3000 Variable	250	+3° , +1300 fpm, 344 sec
g	200,000	10,000 MSL	3000 Variable	250	

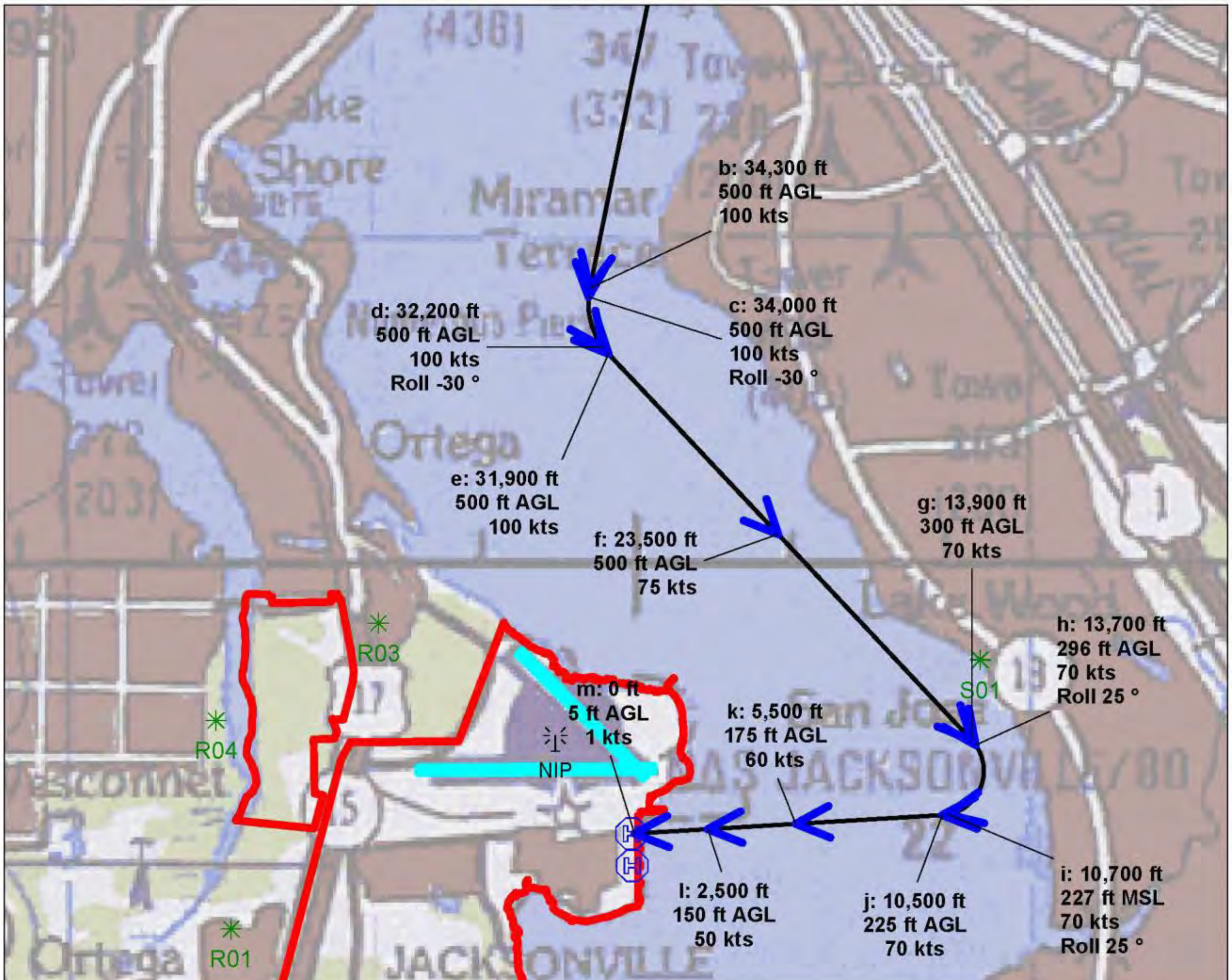
NAS Jacksonville (22 ft MSL) Flight Profile E2D1 - Standard Departure Based E-2C on Runway 10, Flight Track 10D1 - Departure Heading 160

Profile modeled in EIS

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:123,000 (1 inch = 10,200 feet)

N



Point	Distance ft	Height ft	Speed kts	Yaw Angle	Angle of Attack	Roll Angle	Notes
a	64,303	500 AGL	100	0	0	0	+0° , +0 fpm, 178 sec
b	34,300	500 AGL	100	0	0	0	+0° , +0 fpm, 2 sec. start turn
c	34,000	500 AGL	100	0	0	-30	+0° , +0 fpm, 11 sec; achieve roll angle
d	32,200	500 AGL	100	0	0	-30	+0° , +0 fpm, 2 sec. start turn to level 300 ft before end of turn
e	31,900	500 AGL	100	0	0	0	+0° , +0 fpm, 57 sec. level at end of turn
f	23,500	500 AGL	75	0	0	0	-1.2° , -200 fpm, 78 sec. begin descent
g	13,900	300 AGL	70	0	0	0	-1.1° , -100 fpm, 2 sec. start turn
h	13,700	296 AGL	70	0	0	25	-1.3° , -200 fpm, 25 sec; achieve roll angle
i	10,700	227 MSL	70	0	0	25	-0.6° , -100 fpm, 2 sec. start turn to level 200 ft before end of tur
j	10,500	225 AGL	70	0	0	0	-0.6° , -100 fpm, 46 sec. level at end of turn
k	5,500	175 AGL	60	0	0	0	-0.5° , +0 fpm, 32 sec
l	2,500	150 AGL	50	0	0	0	-2.3° , -100 fpm, 58 sec
m	0	5 AGL	1	0	0	0	

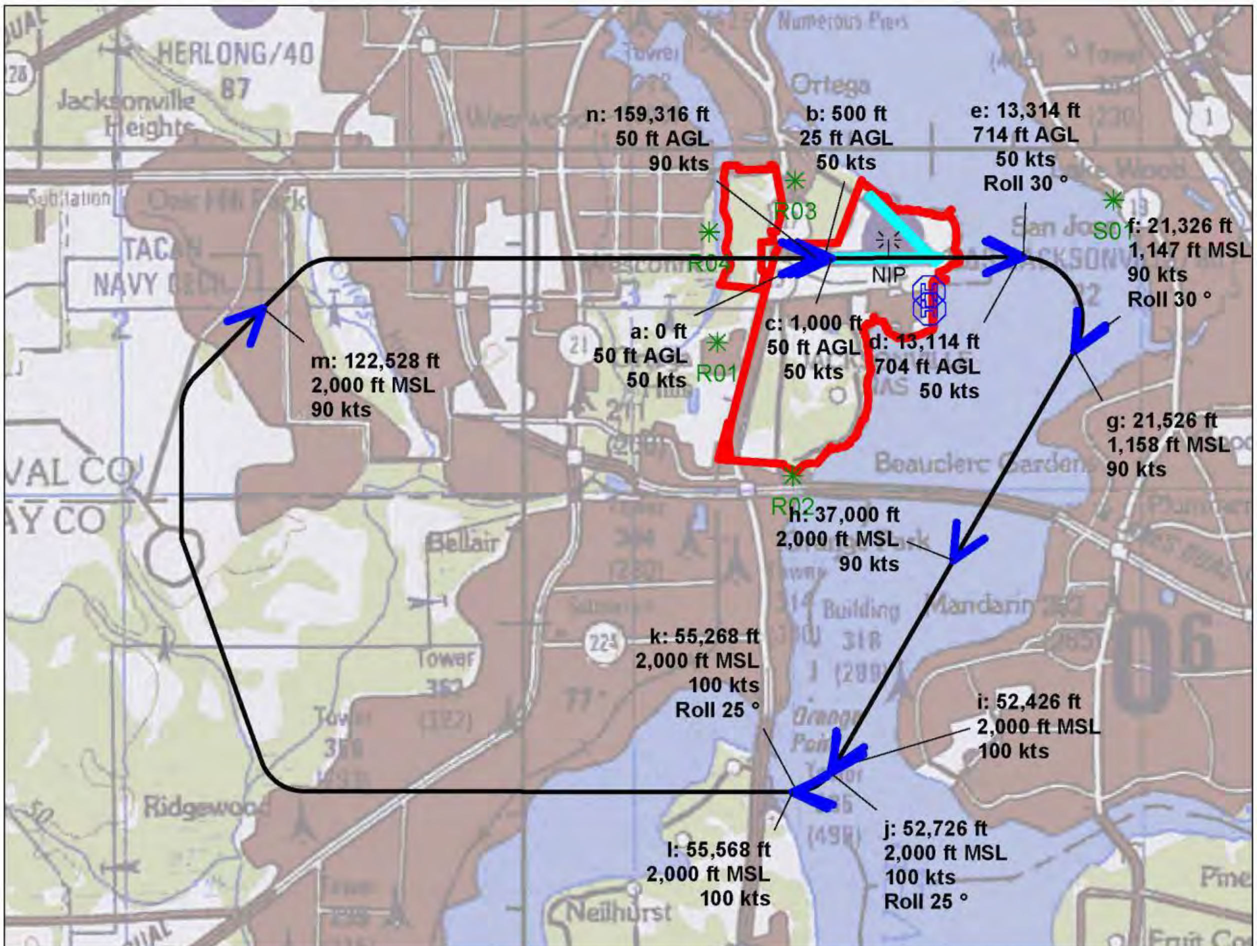
NAS Jacksonville (22 ft MSL) Flight Profile SHA8 - Standard Arrival Based SH60BAAM on Runway PAD3A, Flight Track HA8 - SH60

Profile based on data collection trip to NAS Jax in March 2007. POC Lt. Jeremy Levine

0 4,000 8,000 12,000 16,000 20,000 24,000

Scale in Feet 1:76,800 (1 inch = 6,400 feet)

N



Point	Distance ft	Height ft	Speed kts	Yaw Angle	Angle of Attack	Roll Angle	Notes
a	0	50 AGL	50	0	0	0	-2.9° , -300 fpm, 6 sec
b	500	25 AGL	50	0	0	0	+2.9° , +300 fpm, 6 sec
c	1,000	50 AGL	50	0	0	0	+3° , +300 fpm, 144 sec
d	13,114	704 AGL	50	0	0	0	+2.9° , +300 fpm, 2 sec. Start turn
e	13,314	714 AGL	50	0	0	30	+3° , +400 fpm, 68 sec. achieve roll angle
f	21,326	1,147 MSL	90	0	0	30	+3.1° , +500 fpm, 1 sec. begin roll to level
g	21,526	1,158 MSL	90	0	0	0	+3.1° , +500 fpm, 102 sec. level at end of turn
h	37,000	2,000 MSL	90	0	0	0	+0° , +0 fpm, 96 sec. reach pattern altitude
i	52,426	2,000 MSL	100	0	0	0	+0° , +0 fpm, 2 sec. start turn
j	52,726	2,000 MSL	100	0	0	25	+0° , +0 fpm, 12 sec. achive roll angle
k	55,268	2,000 MSL	100	0	0	25	+0° , +0 fpm, 1 sec. begin roll to level 300 ft before end of turn
l	55,568	2,000 MSL	100	0	0	0	+0° , +0 fpm, 418 sec. level at end of turn
m	122,528	2,000 MSL	90	0	0	0	-3° , -500 fpm, 242 sec. begin final; begin descent
n	159,316	50 AGL	90	0	0	0	

NAS Jacksonville (22 ft MSL) Flight Profile SHG1 - GCA Box Pattern - NEW PROFILE
Based SH60BAAM
on Runway 10, Flight Track 10G1 - GCA Box Pattern (5.4 NM Abeam, 5.18 NM Downwind, 5.13 NM Final)

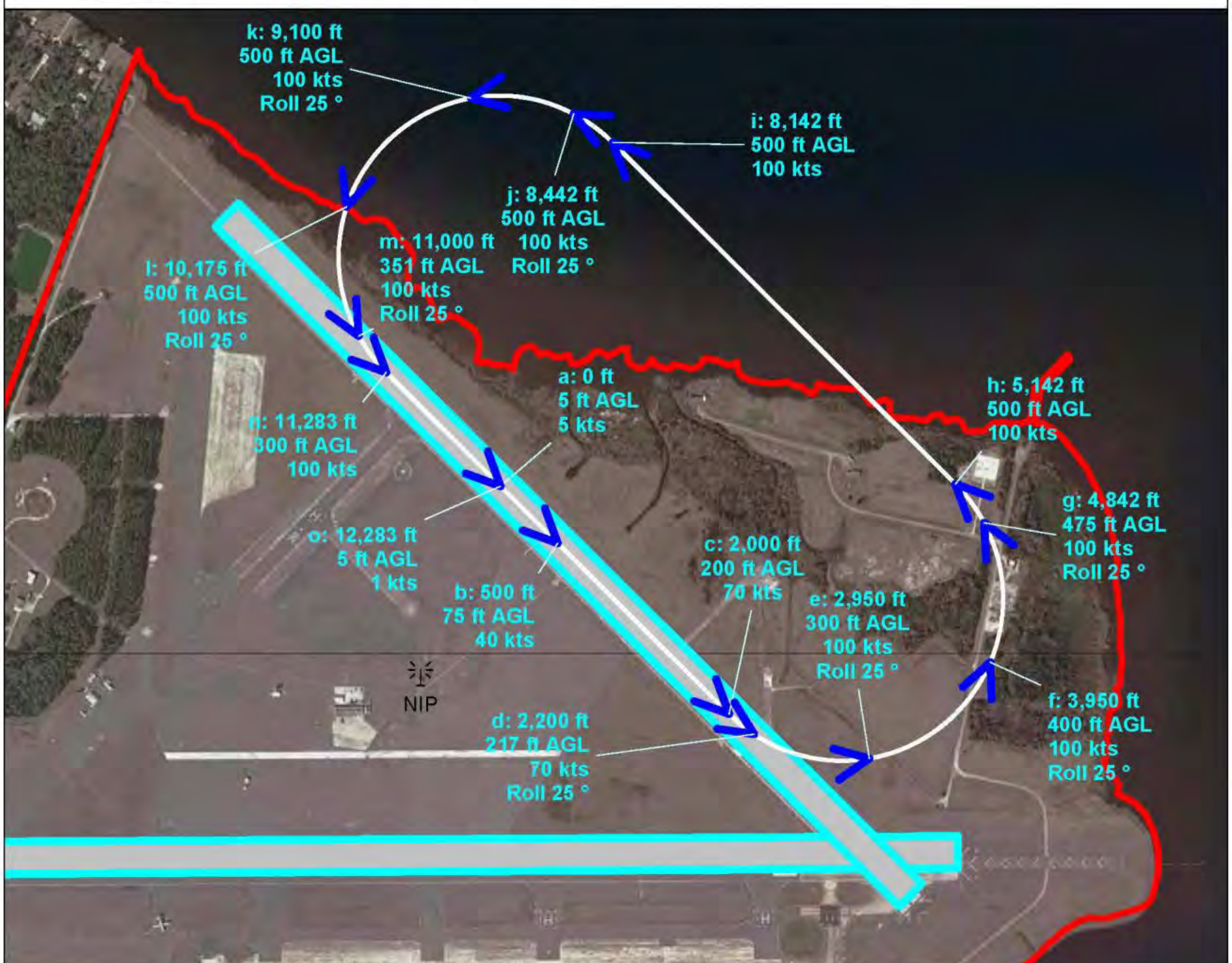
Source of profile is Andersen AFB in Guam, adjusted for Jax course rules

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

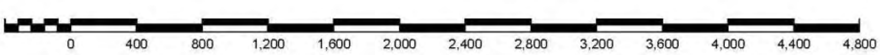
Scale in Feet 1:148,000 (1 inch = 12,400 feet)

N

Point	Distance ft	Height ft	Speed kts	Yaw Angle	Angle of Attack	Roll Angle	Notes
a	0	5 AGL	5	0	0	0	+8° , +300 fpm, 14 sec
b	500	75 AGL	40	0	0	0	+4.8° , +500 fpm, 16 sec
c	2,000	200 AGL	70	0	0	0	+4.9° , +600 fpm, 2 sec. start turn
d	2,200	217 AGL	70	0	0	25	+6.3° , +900 fpm, 5 sec. achieve roll angle
e	2,950	300 AGL	100	0	0	25	+5.7° , +1000 fpm, 6 sec
f	3,950	400 AGL	100	0	0	25	+4.8° , +800 fpm, 5 sec
g	4,842	475 AGL	100	0	0	25	+4.8° , +800 fpm, 2 sec. start roll to level
h	5,142	500 AGL	100	0	0	0	+0° , +0 fpm, 18 sec. level; start downwind; reach pattern altitud
i	8,142	500 AGL	100	0	0	0	+0° , +0 fpm, 2 sec. end downwind; begin turn
j	8,442	500 AGL	100	0	0	25	+0° , +0 fpm, 4 sec. achieve roll angle
k	9,100	500 AGL	100	0	0	25	+0° , +0 fpm, 6 sec
l	10,175	500 AGL	100	0	0	25	-10.2° , -1800 fpm, 5 sec. begin descent
m	11,000	351 AGL	100	0	0	25	-10.2° , -1800 fpm, 2 sec. start roll to level
n	11,283	300 AGL	100	0	0	0	-16.4° , -1400 fpm, 12 sec. end turn; begin final
o	12,283	5 AGL	1	0	0	0	

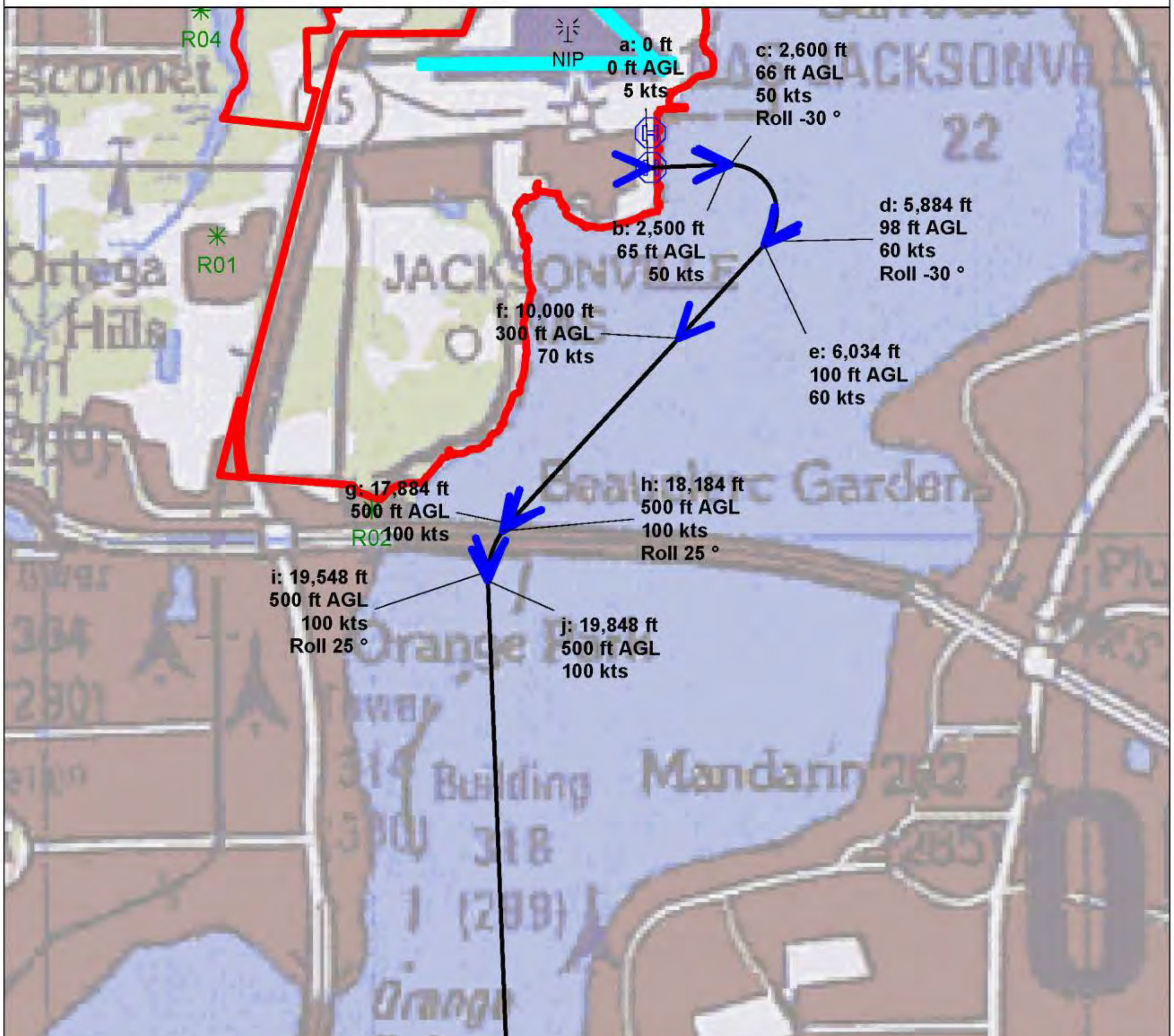


NAS Jacksonville (22 ft MSL) Flight Profile SHT1 - AUTO (500 ft)
Based SH60BAAM
on Runway VERT, Flight Track HT1 - SH60
Auto rotation @ 500 Feet



Scale in Feet 1:14,000 (1 inch = 1,170 feet)

Point	Distance ft	Height ft	Speed kts	Yaw Angle	Angle of Attack	Roll Angle	Notes
a	0	0 AGL	5	0	0	0	+1.5° , +100 fpm, 54 sec
b	2,500	65 AGL	50	0	0	0	+0.6° , +100 fpm, 1 sec. start turn
c	2,600	66 AGL	50	0	0	-30	+0.6° , +100 fpm, 35 sec. achieve roll angle
d	5,884	98 AGL	60	0	0	-30	+0.8° , +100 fpm, 1 sec. begin roll to level 150 ft before end of t
e	6,034	100 AGL	60	0	0	0	+2.9° , +300 fpm, 36 sec. end of turn
f	10,000	300 AGL	70	0	0	0	+1.5° , +200 fpm, 55 sec
g	17,884	500 AGL	100	0	0	0	+0° , +0 fpm, 2 sec. start turn
h	18,184	500 AGL	100	0	0	25	+0° , +0 fpm, 8 sec. achieve roll angle
i	19,548	500 AGL	100	0	0	25	+0° , +0 fpm, 2 sec. begin roll to level 300 ft before end of turn
j	19,848	500 AGL	100	0	0	0	+0° , +0 fpm, 237 sec. level at end of turn
k	59,848	500 AGL	100	0	0	0	



NAS Jacksonville (22 ft MSL) Flight Profile SHD1 - Standard Departure Based SH60BAAM on Runway PAD1D, Flight Track HD1 - SH60

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:67,700 (1 inch = 5,640 feet)

N

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Environmental and Energy
Research & Consulting
128 Maryland Street
El Segundo, CA 90245
www.wyle.com

E Air Emissions Calculations

Table E-1
P-3C Flight Operation Emission Factors

Flight Operation	Emissions from Single Flight Operation[1,2] (lb/op)				
	CO	NO_x	HC	SO_2[3]	PM_{10}
Departure	21.10	12.04	13.46	3.93	5.49
Straight-In Arrival	16.40	9.17	11.13	2.86	5.29
Touch-and-Go	0.77	5.67	0.17	1.22	2.42
GCA Box (GCA Pattern)	1.13	8.70	0.26	1.89	3.69

Notes:

[1] Emission factors for "Departure" and "Straight-In Arrival" from AESO Memorandum Report No. 9911, Revision B (April 2000).

[2] Emission factors for "Touch-and-Go" and "GCA Box" from AESO Memorandum Report No. 9948, Revision B (April 2000).

[3] SO2 Emission Factor adjusted as recommended for operations after 2010 (EI of lbs./1000 adjusted from 0.4 to 2.04) in AESO Memorandum report No 2012-01, May 2012.

Table E-2

P-3C Aircraft Maintenance Run Up Emission Factors

Emissions from Maintenance Test per Aircraft[1] (lb/aircraft-yr)				
CO	NOx	HC	SO_2[2]	PM_{10}
1276.5	468.6	867.1	170.85	271.1

Notes:

[1] Emission factors for "Maintenance Testing" from Table S-2, AESO Memorandum Report No. 9911, Revision B (April 2000).

[2] SO2 Emission Factor adjusted as recommended for operations after 2010 (EI of lbs/1000 adjusted from 0.4 to 2.04) in AESO Memorandum report No 2012-01, May 2012.

Table E-3
P-8A Aircraft Flight Operations Emission Factors

Flight Operation	Emissions from Single Flight Operation[1,2] (lb/op)				
	CO	NO_x	HC	SO_2	PM_{10}
LTO with straight in arrival[1]	17.63	26.68	2.40	2.64	0.88
LTO with overhead break arrival[2]	17.92	36.67	2.44	3.57	1.13
Touch-and-Go[3]	0.19	6.32	0.03	0.59	0.16
GCA Box (GCA Pattern)[3]	0.29	9.99	0.05	0.92	0.25

Notes:

[1] Emission factors for "LTO" Based on Boeing 737-800 Series data from Office of Environment and Energy, Federal Aviation Administration, EDMS (Emissions and Dispersion Modeling System) 5.0.2, June 29, 2007. See Table E-4 below.

[2] Overhead break arrival LTO patterns include a straight-in arrival pattern with an overhead turn, and therefore operation emissions are estimated by adding emissions from one straight-in arrival LTO operation and one GCA pattern operation.

[3] Emission factors for "Touch-and-Go" and "GCA Box" estimated using time in mode values from P-3 operations from AESO Memorandum Report No. 9948, Revision B (April 2000) and power setting, fuel flow, and Emission index information for the Boeing 737-800 (See Table E-5).

Table E-4
Boeing 737-800 Series Emission Factors[1]
Engine: CFM56-7B26

	Time in mode	Fuel Use	Emissions lbs/operation[2]							
			CO	HC	NMHC	VOC	NO_X	SO_X[2]	PM_{10}[3]	$PM_{2.5}$[3]
APU (total)	26	N/A	0.539	0.041	0.047	0.047	0.734	0.174	0.089	0.089
Start Up			N/A	0.611	0.706	0.702	N/A	N/A	N/A	N/A
Taxi Out	19.00	674.102	11.861	1.199	1.386	1.379	3.298	0.871	N/A	N/A
Takeoff	1.55	518.527	0.195	0.049	0.056	0.056	14.871	0.670	0.118	0.118
Climb out	0.43	113.285	0.047	0.011	0.013	0.013	2.588	0.146	0.024	0.024
Approach	3.73	326.276	0.592	0.040	0.046	0.046	3.558	0.422	N/A	N/A
Taxi in (including Runway rollout	7.21	277.398	4.398	0.444	0.514	0.511	1.630	0.358	N/A	N/A
Total, per LTO		1909.59	17.63	2.40	2.77	2.75	26.68	2.64	0.88	0.88

1 Office of Environment and Energy, Federal Aviation Administration, EDMS (Emissions and Dispersion Modeling System) 5.1.3, November 15, 2010. Time in mode, Fuel use, and Emissions for one LTO operation at Whidbey Island NAS, which provides similar but more conservative total emissions than Jacksonville and Kanaohe Bay Stations.

[2] SO_2 emissions based on fuel Sulfur content, SO2 Emission Factor adjusted as recommended for operations after 2010 (EI of lbs/1000 adjusted from 1.29 to 2.04) in AESO Memorandum report No 2012-01, May 2012.

[3] PM emissions only provided in EDMS 5.1.3 for APU, Takeoff and Climb out, and are provided for reference only. Total Emissions of PM10 and PM2.5 per LTO from EDMS 5.0.2 for 737-800 at Whidbey Island.

Table E-5
P-8A Touch and Go/GCA Flight Operation Emission Factors

Flight Operation and Flight Mode	Engine Power Setting[1]	No. of Engines in Use[1]	Time-In Mode per Engine (min) [2]	Fuel Flow Rate per Engine (lb/hr) [1]	Fuel Used (lbs) [4]	Emission Indexes [1] (pounds per 1,000 pounds fuel) EI CO	EI NO_x	EI HC	EI SO_2 [5]	EI PM_{10} [6]	Emissions from Single Flight Operation [7] (lb/ op) CO	NO_x	HC	SO_2	PM_{10}
Touch-and-Go (T&G)															
Approach	30	2	1	551.93	18	1.6	10.8	0.1	2.04	0.294	0.029	0.199	0.002	0.038	0.005
Climb out	85	2	2	1631.30	109	0.6	22.5	0.1	2.04	0.563	0.065	2.447	0.011	0.222	0.061
Circle	85	2	3	1631.30	163	0.6	22.5	0.1	2.04	0.563	0.098	3.670	0.016	0.333	0.092
Single Touch-and-Go Totals					**290**						**0.19**	**6.32**	**0.03**	**0.59**	**0.16**
Ground-Controlled Approach (GCA) Box															
Approach	30	2	1	551.93	18	1.6	10.8	0.1	2.04	0.294	0.029	0.199	0.002	0.038	0.005
Climb out	85	2	3	1631.30	163	0.6	22.5	0.1	2.04	0.563	0.098	3.670	0.016	0.333	0.092
Circle3	85	2	5	1631.30	272	0.6	22.5	0.1	2.04	0.563	0.163	6.117	0.027	0.555	0.153
Single Ground-Controlled Approach Box Totals					**453**						**0.29**	**9.99**	**0.05**	**0.92**	**0.25**

Notes:

[1] Estimated based on ICAO emission index information, emission database, for engine CFM56-7B26 (ICAO 2007). Retrieved at http://easa.europa.eu/environment/edb/aircraft-engine-emissions.php

[2] Time in mode values estimated based on P-3 C time-in-mode values provided by AESO in Memorandum Report No. 9948, Revision B.

[3] Level flight operations are not available, therefore conservatively assumed at ICAO climb out power settings.

[4] Fuel used = fuel flow x time-in-mode / 60 x no. of engines in use.

[5] SO_2 emissions based on fuel Sulfur content, SO2 Emission Factor adjusted as recommended for operations after 2010 (EI of lbs/1000 of 2.04)in AESO Memorandum report No 2012-01, May 2012.

[6] PM_{10} emissions based on EDMS calculated emission rate per 1000 lbs fuel.

[7] Emissions = fuel used / 1,000 x emission index

Table E-6

P-8A Maintenance Run Up Operation Emission Factors

Operation	Annual # Ops per aircraft[2,8]	Engine Power Setting[1,3]	No. of Engines in Use[2]	Time-in Mode per Engine (min)[2,8]	Fuel flow rate per Engine (lb/hr)[1,9]	Fuel Used (lbs)[4]	Emission Indexes[1,9] (pounds per 1,000 pounds fuel)					Annual Emissions per Operation type, per aircraft (Lbs/aircraft/yr)[7]				
							EI CO	EI NO_x	EI HC	EI SO_2[5]	EI PM_{10}[6]	CO	NO_x	HC	SO_2	PM_{10}
Leak Check	2	30	1	5	551.93	46	1.6	10.8	0.1	2.04	0.294	0.147	0.993	0.009	0.188	0.027
Pressure Check	1	30	1	12	551.93	110	1.6	10.8	0.1	2.04	0.294	0.177	1.192	0.011	0.225	0.032
APU Check	3	On	1	17	164.23	47	1.00	6.1	0.25	2.04	0.200	0.140	0.852	0.035	0.285	0.028
TOTAL LBS EMISSION PER AIRCRAFT PER YEAR												**0.463**	**3.037**	**0.055**	**0.698**	**0.087**

Notes:

1 Estimated based on ICAO emission index information, emission database, for engine CFM56-7B26 (ICAO 2007). Retrieved at http://easa.europa.eu/environment/edb/aircraft-engine-emissions.php

2 # Operations per aircraft, No. of Engines, Time in mode values from Wyle Laboratories 2013 Noise Report.

3 Engine power setting from Wyle 2000 Report is 20% N1. Power setting is conservatively assumed to be 30%, to match closest ICAO Emission Indexes available (ICAO 2007).

4 Fuel used = fuel flow x time-in-mode / 60 x no. of engines in use.

5 SO_2 emissions based on fuel Sulfur content, SO2 Emission Factor adjusted as recommended for operations after 2010 (EI of lbs/1000 adjusted from 0.4 to 2.04) in AESO Memorandum report No 2012-01, May 2012.

6 PM10 emissions based on EDMS calculated emission rate per 1000 lbs fuel.

7 Emissions = fuel used / 1,000 x emission index

8 APU Check not included in Wyle Laboratories 2013 Noise Report. # of operations and time in mode assumed to be the same as the sum of other testing.

9 APU Check fuel flow and emission indexes (except SO2) based on GTC 36-200 APU, Ground Check-out Mode, from AESO Memorandum Report No. 2003-09 (September 2003).

Table E-7
Existing and Projected Emissions from P-3C and P-8A Aircraft Operations and POV Changes at NAS Jacksonville

Flight Operation	No. of Aircraft[1]	No. of Operations[1,3]	Emissions (tpy)[2] CO	NO_x	VOC	SO_2	PM_{10}
Existing Conditions 2014							
P-3C Operations	**22**						
Straight-In Arrival LTOs		2,042	38.3	21.7	25.1	6.9	11.0
Touch-and-Go		3,632	1.4	10.3	0.3	2.2	4.4
GCA Pattern		1,124	0.6	4.9	0.1	1.1	2.1
Maintenance Run Ups			14.04	5.15	9.54	1.88	2.98
Total P-3C Flight Ops Emissions			**54.4**	**42.0**	**35.1**	**12.1**	**20.5**
P-8A Operations	**34**						
Straight-In Arrival LTOs		2,576	22.7	34.4	3.1	3.4	1.1
Touch-and-Go		3,259	0.3	10.3	0.0	1.0	0.3
GCA Pattern		1,107	0.2	5.5	0.0	0.5	0.1
Maintenance Run Ups			0.008	0.052	0.001	0.012	0.001
Total P-8A Flight Ops Emissions			**23.2**	**50.2**	**3.2**	**4.9**	**1.5**
Total Existing Flight Ops Emissions			**77.6**	**92.2**	**38.3**	**17.0**	**22.0**
Existing personnel POV Emissions			**191.2**	**14.8**	**20.3**	**0.00**	**56.4**
Total Existing (No Action) Annual Operational Emission Totals			**268.8**	**107.0**	**58.6**	**17.0**	**78.3**
Alternative 1							
P-3C Operations	**0**						
Straight-In Arrival LTOs		0	0.0	0.0	0.0	0.0	0.0
Touch-and-Go		0	0.0	0.0	0.0	0.0	0.0
GCA Pattern		0	0.0	0.0	0.0	0.0	0.0
Maintenance Run Ups			0.000	0.000	0.000	0.000	0.000
Total P-3C Flight Ops Emissions			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
P-8A Operations	**54**						
Straight-In Arrival LTOs		4,357	38.4	58.1	5.2	5.8	1.9
Touch-and-Go		5,820	0.6	18.4	0.1	1.7	0.5
GCA Pattern		1,823	0.3	9.1	0.0	0.8	0.2
Maintenance Run Ups			0.013	0.082	0.001	0.019	0.002
Total P-8A Flight Ops Emissions			**39.2**	**85.7**	**5.3**	**8.3**	**2.6**
Total Flight Ops Emissions			**39.2**	**85.7**	**5.3**	**8.3**	**2.6**
Baseline Flight Ops Emissions			**77.6**	**92.2**	**38.3**	**17.0**	**22.0**
Change in Aircraft Emissions			**-38.3**	**-6.5**	**-32.9**	**-8.6**	**-19.4**
Change in POV Emissions			**-30.8**	**-2.4**	**-3.3**	**0.00**	**-9.08**
Total Change in Annual Operational Emission Totals			**-69.1**	**-8.9**	**-36.2**	**-8.6**	**-28.5**
Alternative 2							
P-3C Operations	**0**						
Straight-In Arrival LTOs		0	0.0	0.0	0.0	0.0	0.0
Touch-and-Go		0	0.0	0.0	0.0	0.0	0.0
GCA Pattern		0	0.0	0.0	0.0	0.0	0.0
Maintenance Run Ups			0.000	0.000	0.000	0.000	0.000
Total P-3C Flight Ops Emissions			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
P-8A Operations	**47**						
Straight-In Arrival LTOs		4,080	36.0	54.4	4.9	5.4	1.8
Touch-and-Go		5,621	0.5	17.8	0.1	1.7	0.4
GCA Pattern		1,710	0.2	8.5	0.0	0.8	0.2
Maintenance Run Ups			0.011	0.071	0.001	0.016	0.002
Total P-8A Flight Ops Emissions			**36.8**	**80.8**	**5.0**	**7.9**	**2.4**
Total Flight Ops Emissions			**36.8**	**80.8**	**5.0**	**7.9**	**2.4**
Baseline Flight Ops Emissions			**77.6**	**92.2**	**38.3**	**17.0**	**22.0**
Change in Aircraft Emissions			**-40.8**	**-11.4**	**-33.2**	**-9.12**	**-19.5**
Change in POV Emissions			**-50.2**	**-3.9**	**-5.3**	**0.00**	**-14.8**
Total Change in Annual Operational Emission Totals			**-90.9**	**-15.3**	**-38.6**	**-9.1**	**-34.3**

Notes:
[1] Number of Aircraft from Navy, 2013. Operations information from Wyle Laboratories, 2013. Wyle data presents projected P-3C totals that include C-130, which are subtracted from existing and proposed to define P-3C totals.

[2] Emissions calculated using emission factors provided in Tables E-1, E-2, E-3 and E-4: #Ops (or #Aircraft) x EF(lbs emission/op)/2000

[3] For Air Operation Emission calculations, an LTO includes a departure and an arrival, and T&G and GCA patterns also include 2 operations, therefore totals for noise operations will be double air quality operation numbers.

Table E-8

Existing and Projected Emissions from P-3C and P-8A Aircraft Operations and POV Changes at NAS Whidbey Island

Flight Operation	No. of Aircraft[1]	No. of Operations[1,3]	Emissions (tpy)[2] CO	NO_x	VOC	SO_2	PM_{10}
Existing Conditions 2014							
P-3C Operations	**24**						
Straight-In Arrival LTOs		1,852	34.7	19.6	22.8	6.3	10.0
Touch-and-Go		3,652	1.4	10.4	0.3	2.2	4.4
GCA Pattern		1,811	1.0	7.9	0.2	1.7	3.3
Maintenance Run Ups			15.32	5.62	10.41	2.05	3.25
Total P-3C Flight Ops Emissions			**52.5**	**43.5**	**33.7**	**12.3**	**21.0**
P-8A Operations	**0**						
Straight-In Arrival LTOs		0	0.0	0.0	0.0	0.0	0.0
Touch-and-Go		0	0.0	0.0	0.0	0.0	0.0
GCA Pattern		0	0.0	0.0	0.0	0.0	0.0
Maintenance Run Ups			0.000	0.000	0.000	0.000	0.000
Total P-8A Flight Ops Emissions			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Existing Flight Ops Emissions			**52.5**	**43.5**	**33.7**	**12.3**	**21.0**
Existing personnel POV Emissions			**135.7**	**10.5**	**14.4**	**0.0**	**40.0**
Total Existing (No Action) Annual Operational Emission Totals			**188.1**	**54.0**	**48.1**	**12.3**	**61.0**
Alternative 1							
P-3C Operations	**0**						
Straight-In Arrival LTOs		0	0.0	0.0	0.0	0.0	0.0
Touch-and-Go		0	0.0	0.0	0.0	0.0	0.0
GCA Pattern		0	0.0	0.0	0.0	0.0	0.0
Maintenance Run Ups			0.000	0.000	0.000	0.000	0.000
Total P-3C Flight Ops Emissions			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
P-8A Operations	**42**						
Straight-In Arrival LTOs		2,031	17.9	27.1	2.4	2.7	0.9
Touch-and-Go		1,920	0.2	6.1	0.0	0.6	0.2
GCA Pattern		1,194	0.2	6.0	0.0	0.6	0.1
Maintenance Run Ups			0.010	0.064	0.001	0.015	0.002
Total P-8A Flight Ops Emissions			**18.3**	**39.2**	**2.5**	**3.8**	**1.2**
Total Flight Ops Emissions			**18.3**	**39.2**	**2.5**	**3.8**	**1.2**
Baseline Flight Ops Emissions			**52.5**	**43.5**	**33.7**	**12.3**	**21.0**
Change in Aircraft Emissions			**-34.2**	**-4.3**	**-31.2**	**-8.5**	**-19.8**
Change in POV Emissions			**-6.6**	**-0.5**	**-0.7**	**0.000**	**-1.94**
Total Change in Annual Operational Emission Totals			**-40.8**	**-4.8**	**-31.9**	**-8.5**	**-21.7**
Alternative 2							
P-3C Operations	**0**						
Straight-In Arrival LTOs		0	0.0	0.0	0.0	0.0	0.0
Touch-and-Go		0	0.0	0.0	0.0	0.0	0.0
GCA Pattern		0	0.0	0.0	0.0	0.0	0.0
Maintenance Run Ups			0.000	0.000	0.000	0.000	0.000
Total P-3C Flight Ops Emissions			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
P-8A Operations	**49**						
Straight-In Arrival LTOs		2,347	20.7	31.3	2.8	3.1	1.0
Touch-and-Go		2,129	0.20	6.72	0.03	0.63	0.17
GCA Pattern		1,333	0.19	6.66	0.03	0.62	0.17
Maintenance Run Ups			0.011	0.074	0.001	0.017	0.002
Total P-8A Flight Ops Emissions			**21.1**	**44.8**	**2.9**	**4.4**	**1.4**
Total Flight Ops Emissions			**21.1**	**44.8**	**2.9**	**4.4**	**1.4**
Baseline Flight Ops Emissions			**52.5**	**43.5**	**33.7**	**12.3**	**21.0**
Change in Aircraft Emissions			**-31.4**	**1.3**	**-30.8**	**-7.9**	**-19.6**
Change in POV Emissions			**12.8**	**1.0**	**1.4**	**0.00**	**3.8**
Total Change in Annual Operational Emission Totals			**-18.6**	**2.3**	**-29.5**	**-7.9**	**-15.9**

Notes:

[1] Number of Aircraft from Navy, 2013. Operations information from Wyle Laboratories, 2013. Wyle data presents projected P-3C totals that include C-12, which are subtracted from existing and proposed to define P-3C totals.

[2] Emissions calculated using emission factors provided in Tables E-1, E-2, E-3 and E-4: #Ops (or #Aircraft) x EF(lbs emission/op)/2000

[3]For Air Operation Emission calculations,an LTO includes a departure and an arrival, and T&G and GCA patterns also include 2 operations, therefore totals for noise operations will be double air quality operation numbers.

Table E-9
Existing and Projected Emissions from P-3C and P-8A Aircraft Operations and POV Changes at MCBH Kaneohe Bay

Flight Operation	No. of Aircraft[1]	No. of Operations[1,3]	Emissions (tpy)[2] CO	NO_x	VOC	SO_2	PM_{10}
Existing Conditions 2014							
P-3C Operations	**24**						
Straight-In Arrival LTOs		3,220	60.4	34.1	39.6	10.9	17.4
Touch-and-Go		6,400	2.5	18.1	0.5	3.9	7.7
GCA Pattern		475	0.3	2.1	0.1	0.4	0.9
Maintenance Run Ups			15.32	5.62	10.41	2.05	3.25
Total P-3C Flight Ops Emissions			**78.4**	**60.0**	**50.6**	**17.3**	**29.2**
P-8A Operations	**0**						
Straight-In Arrival LTOs		0	0.0	0.0	0.0	0.0	0.0
Touch-and-Go		0	0.0	0.0	0.0	0.0	0.0
GCA Pattern		0	0.0	0.0	0.0	0.0	0.0
Maintenance Run Ups			0.000	0.000	0.000	0.000	0.000
Total P-8A Flight Ops Emissions			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Existing Flight Ops Emissions			**78.4**	**60.0**	**50.6**	**17.3**	**29.2**
Existing personnel POV Emissions			**105.4**	**8.1**	**11.2**	**0.00**	**31.1**
Total Existing (No Action) Annual Operational Emission Totals			**183.8**	**68.1**	**61.8**	**17.3**	**60.3**
Alternative 1 and 2							
P-3C Operations	**0**						
Straight-In Arrival LTOs		0	0.0	0.0	0.0	0.0	0.0
Touch-and-Go			0.0	0.0	0.0	0.0	0.0
GCA Pattern			0.0	0.0	0.0	0.0	0.0
Maintenance Run Ups			0.000	0.000	0.000	0.000	0.000
Total P-3C Flight Ops Emissions			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
P-8A Operations	**2**						
Straight-In Arrival LTOs		104	0.9	1.4	0.12	0.1	0.05
Touch-and-Go		0	0.0	0.0	0.0	0.0	0.0
GCA Pattern		0	0.0	0.0	0.0	0.0	0.0
Maintenance Run Ups			0.000	0.003	0.000	0.001	0.000
Total P-8A Flight Ops Emissions			**0.9**	**1.4**	**0.1**	**0.1**	**0.05**
Total Flight Ops Emissions			**0.9**	**1.4**	**0.1**	**0.1**	**0.0**
Baseline Flight Ops Emissions			**78.4**	**60.0**	**50.6**	**17.3**	**29.2**
Change in Aircraft Emissions			**-77.5**	**-58.6**	**-50.5**	**-17.2**	**-29.2**
Change in POV Emissions			**-97.9**	**-7.6**	**-10.4**	**0.00**	**-28.9**
Total Change in Annual Operational Emission Totals			**-175.4**	**-66.2**	**-60.9**	**-17.2**	**-58.0**

Notes:

[1] Existing P-3C operations are from the Final EIS for Basing MV22 and H1 Aircraft in Support of III MEF Elements in Hawaii, Baseline Annual Flight Operations, as reported in Appendix D(Noise Analysis Report, Wyle, 2012), (D-1.1, Table 1.1-1). There are no existing P-8A operations in that analysis. Total projected operations of P-8A are as provided by the Navy. For Alts 1 and 3, it is assumed that all operations are departures or arrivals. For Alt 2, the total operation number was divided into LTOs, T&G, and GCA based on the ratio of total operations/mission specific operations of the existing P-3C. There are no projected P-3C operations under any alternative.

[2] Emissions calculated using emission factors provided in Tables E-1, E-2, E-3 and E-4: #Ops (or #Aircraft) x EF(lbs emission/op)/2000

[3] For Air Operation Emission calculations,an LTO includes a departure and an arrival, and T&G and GCA patterns also include 2 operations, therefore totals for noise operations will be double air quality operation numbers.

Table E-10
POV Emissions, All Alternatives, All Stations

Alternatives	Number of Vehicles[2]	Change from Baseline	Avg Daily commute mileage per vehicle	Avg Annual commuting Miles Per Vehicle[3]	Total Annual Miles	Emission Factors (g/VMT)[1]						Emissions (tpy)					
						CO	NOx	VOC	SO2	PM10	PM2.5	CO	NOx	VOC	SO2	PM10	PM2.5
NAS Jacksonville																	
Baseline/No Action	2619	0	25	6,250	16,368,750	10.62	0.82	1.13	0.00	3.13	0.35	191.22	14.79	20.33	0.00	56.36	6.22
Alternative 1	2197	-422	25	6,250	-2,637,500	10.62	0.82	1.13	0.00	3.13	0.35	-30.81	-2.38	-3.28	0.00	-9.08	-1.00
Alternative 2	1932	-687	25	6,250	-4,293,750	10.62	0.82	1.13	0.00	3.13	0.35	-50.16	-3.88	-5.33	0.00	-14.78	-1.63
NAS Whidbey Island																	
Baseline/No Action	1858	0	25	6,250	11,612,500	10.62	0.82	1.13	0.00	3.13	0.35	135.66	10.49	14.42	0.00	39.98	4.41
Alternative 1	1768	-90	25	6,250	-562,500	10.62	0.82	1.13	0.00	3.13	0.35	-6.57	-0.51	-0.70	0.00	-1.94	-0.21
Alternative 2	2033	175	25	6,250	1,093,750	10.62	0.82	1.13	0.00	3.13	0.35	12.78	0.99	1.36	0.00	3.77	0.42
MCBH Kaneohe Bay																	
Baseline/No Action	1443	0	25	6,250	9,018,750	10.62	0.82	1.13	0.00	3.13	0.35	105.36	8.15	11.20	0.00	31.05	3.43
Alternative 1	102	-1341	25	6,250	-8,381,250	10.62	0.82	1.13	0.00	3.13	0.35	-97.91	-7.57	-10.41	0.00	-28.86	-3.18
Alternative 2	102	-1341	25	6,250	-8,381,250	10.62	0.82	1.13	0.00	3.13	0.35	-97.91	-7.57	-10.41	0.00	-28.86	-3.18

Notes:

[1] Emission Factors from "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks (EPA420-F-08-024, EPA 2008). See Table E-11.

[2] Assumes one vehicle for each relocated employee, based on projected personnel loadings for existing P-3C and projected P-8A MMA Squadrons only.

[3] Assumes 250 daily commutes per year.

[4] Include emission exhaust and road dust (See Table E-11).

Table E-11
Onroad Vehicle Exhaust Emission Factors

Equipment Type	Fuel Type	Exhaust Emission Factor[a] (g/VMT)							Road Dust Emission Factor[d] (g/VMT)		Total PM Emission Factor[are] (g/VMT)	
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Gasoline Light Trucks	Gasoline	1.03	9.40	0.69	0.0000	0.0044	0.0041	368	3.13	0.341	3.13	0.345
Gasoline Passenger Cars	Gasoline	1.22	11.84	0.95	0.0000	0.0049	0.0045	514	3.13	0.341	3.13	0.346
Average Gasoline Vehicles	Gasoline	1.13	10.62	0.82	0.00	0.00	0.00	440.95	3.13	0.341	3.13	0.346
Diesel Vehicles	Diesel	0.28	1.10	8.06	0.158	0.17	0.17	1,400	3.13	0.341	3.30	0.511

Notes:

a. Emission factors for gasoline worker vehicles from "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks (EPA420-F-08-024, EPA 2008). It was assumed that the vehicle make-up included 50% cars and 50% light-duty trucks/SUVs.

b. Emission factors for diesel worker and delivery vehicles (except SO2 and CO2) from "Assessing the Effects of Freight Movement on Air Quality at the National and Regional Level- Final Report" (U.S. Federal Highway Administration 2005).

c. CO_2 and SO_2 emission factors for diesel worker and delivery vehicles from "Greenhouse Gas Protocol - Corporate Accounting and Reporting Standard / Mobile Guide" (World Resources Institute/World Business Council for Sustainable Development 2005). SO2 emission factor calculated from diesel consumption rate and a sulfur content of 348 ppm.

d. See emission factor derivation table below.

e. Sum of exhaust and road dust emission factors.

Paved Roads - Emission Factor Derivation Table

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$ AP-42 Section 13.2.1 (11/06 version)

where:
- E = particulate emission factor (lb/VMT)
- k = particle size multiplier
- sL = road surface silt loading (g/m^2)
- W = average vehicle weight (tons)
- C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	tons	3	3	Assumption
k factor	g/VMT	7.3	1.1	Table 13.2-1.1
Silt Loading, sL	g/m^2	0.6	0.6	Table 13.2.1-3
Emission factor, C	g/VMT	0.2119	0.1617	Table 13.2.1-2
Emission factor, E	g/VMT	3.13	0.341	Table 13.2.1-3

Table E-12

Construction Equipment Exhaust Emission Factors, Based on EPA NONROAD emission rates, All Stations

Equipment Type	Type	SCC	Avg Size[1] (hp)	Load[2]	Range	Emission Factor[3] (g/hp-hr)					Equipment Emission Rate[4] (lbs-hr)				
						NO_x	VOC	CO	SO_2	PM_{10}	NO_x	VOC	CO	SO_2	PM_{10}
Asphalt Paving Machine	Diesel	2270002003	91	0.59	75<hp≤100	2.63	0.27	2.83	0.006	0.38	0.31	0.03	0.33	0.001	0.04
Vibratory Compactor	Diesel	2270002009	8	0.43	6<hp≤11	4.95	0.68	4.49	0.007	0.50	0.04	0.01	0.03	0.000	0.00
Generators	Diesel	2270006005	22	0.43	16<hp≤25	5.36	0.74	3.03	0.007	0.49	0.11	0.02	0.06	0.000	0.01
Air Compressors	Diesel	2270006015	37	0.43	25<hp≤40	4.28	0.25	1.28	0.007	0.23	0.15	0.01	0.04	0.000	0.01
Excavator/Loaders/Backhoes	Diesel	2270002066	77	0.21	75<hp≤100	5.14	1.03	6.13	0.008	0.91	0.18	0.04	0.22	0.000	0.03
Aerial Lifts (Cherry Pickers)	Diesel	2270003010	43	0.21	40<hp≤50	5.88	1.81	6.78	0.008	0.98	0.12	0.04	0.13	0.000	0.02
Crawler Tractor/Dozers	Diesel	2270002069	157	0.59	100<hp≤175	2.44	0.21	1.00	0.006	0.24	0.50	0.04	0.20	0.001	0.05
Off-Highway Trucks	Diesel	2270002051	489	0.59	300<hp≤600	1.97	0.15	0.78	0.006	0.13	1.25	0.10	0.50	0.004	0.08
Marine Equipment	Diesel	2282005010	1250	0.51	hp>750	4.50	0.30	1.00	0.006	0.40	6.32	0.42	1.41	0.008	0.56
Misc. Light Pumps	Diesel	2270006010	20	0.74	16<hp≤25	5.36	0.74	3.03	0.007	0.49	0.17	0.02	0.10	0.000	0.02
Commercial Welder	Diesel	2270006025	35	0.45	25<hp≤40	4.28	0.25	1.28	0.007	0.23	0.15	0.01	0.04	0.000	0.01
Pressure Washers	Diesel	2270006030	9	0.3	6<hp≤11	4.95	0.68	4.49	0.007	0.50	0.03	0.00	0.03	0.000	0.00
Roller	Diesel	2270002015	95	0.61	75<hp≤100	5.14	1.03	6.13	0.008	0.91	0.66	0.13	0.78	0.001	0.12
Crane (Hydraulic Truck)	Diesel	2270002045	194	0.47	175<hp≤300	2.80	0.20	1.00	0.006	0.40	0.56	0.04	0.20	0.001	0.08
Crane (Crawler)	Diesel	2270002045	489	0.47	200<hp≤500	8.38	0.68	2.70	0.006	0.40	4.25	0.34	1.37	0.003	0.20
Scraper	Diesel	2270002018	311	0.7	300<hp≤600	1.97	0.15	0.78	0.006	0.13	0.95	0.07	0.38	0.003	0.06
Surfacing Equipment	Diesel	2270002024	183	0.49	150<hp≤250	2.80	0.20	1.00	0.006	0.40	0.55	0.04	0.20	0.001	0.08
Trencher	Diesel	2270002030	77	0.66	50<hp≤100	8.30	0.99	3.49	0.008	0.72	0.93	0.11	0.39	0.001	0.08
Concrete Saw	Diesel	2270002039	79	0.78	75<hp≤100	5.14	1.03	6.13	0.008	0.91	0.70	0.14	0.83	0.001	0.12
Cement Mixer	Diesel	2270002042	11	0.59	6<hp≤20	5.20	0.70	2.00	0.007	0.60	0.07	0.01	0.03	0.000	0.01
Drill Rig	Diesel	2270002033	209	0.79	100<hp≤250	8.38	0.68	2.70	0.006	0.40	3.05	0.25	0.98	0.002	0.15
Grader	Diesel	2270002048	172	0.64	150<hp≤250	4.50	0.40	1.00	0.006	0.40	1.09	0.10	0.24	0.001	0.10
Skid Steer	Diesel	2270002072	131	0.58	50<hp≤250	3.30	0.20	1.00	0.006	0.72	0.55	0.03	0.17	0.001	0.12
Telehandler	Diesel	2270003020	111	0.3	100<hp≤125	6.90	0.20	1.00	0.006	0.40	0.51	0.01	0.07	0.000	0.03

Notes:

1. Avg hp from "Nonroad Engine and Vehicle Emissions Study Report" EPA 460/3-91-02. Nov 1991.
2. Load from "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling" EPA420-P-04-005. April 2004
3. Emission factors from EPA's NONROAD model (Year 2014) and NR-009A, June 15, 1998.
4. Equipment Emission Rate = Average HP x Load x Emission Factor x 453.6 g/lb.

Table E-13
MMA Facility Construction - NAS Jacksonville

Alternative	total sq ft	total m^2	Acres
Alternative 1 and 2			
Renovation			
Building 511	2,723.00	252.97	
Renovation Total	2,723.00	252.97	0.06
Impervious Surface			
Impervious Surface (Asphalt Paving) Total	127,252.00	11,821.71	2.92
Impervious Surface (Concrete) Total	434,394.00	40,355.20	9.97
Fine grading and soil prep (for seed and sod) (assumed to be grass areas surrounding new surfaces only: same area as surfaces)	561,646.00	52,176.91	12.89
		0.00	
Total graded space	1,126,015.00	104,606.79	25.85

Refer to Section 2 of SEIS for Construction Information. Estimated sq ft totals provided by the Navy and may differ from acreage estimates in Chapter 2 which were developed using GIS. Emission calculations assume all construction activities will be performed within one year.

	Total Sq Ft	Thickness (Ft)	Volume (cubic yard)	Cubic Yards per Truckload	Total # Loads
Concrete surfaces	434,394	1	16,090		
Concrete Delivered			16,090	20	804

Table E-14

Mobile Equipment Exhaust Emissions No Action Alternative: NAS Jacksonville, All Alternatives

Activity	Equipment List	Equipment quantity	Days Used	Emission Factors (lb/day)[1] NOx	VOC	CO	SO_2[2]	PM_{10}		Emissions (lbs/year) NOx	VOC	CO	SO_2	PM_{10}
Backhoe Excavation	Backhoe Loader	2	250	1.47	0.29	1.75	0.002	0.26		732.64	147.30	873.81	1.14	130.04
	Haul Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Cut and fill	Scraper	2	250	7.57	0.58	3.01	0.02	0.50		3783.83	291.80	1503.17	11.52	249.57
	Bulldozer	2	250	3.98	0.34	1.63	0.01	0.39		1989.01	168.27	816.84	4.90	196.86
	Water Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Trenching	Trencher	2	250	7.44	0.89	3.13	0.01	0.65		3719.63	443.67	1564.04	3.59	322.67
	Track loader	2	250	1.47	0.29	1.75	0.00	0.26		732.64	147.30	873.81	1.14	130.04
Grading	Grader	2	250	8.74	0.78	1.94	0.01	0.78		4368.25	388.29	970.72	5.82	388.29
	Bulldozer	2	250	3.98	0.34	1.63	0.01	0.39		1989.01	168.27	816.84	4.90	196.86
	Water Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Demolition	Backhoe Loader	0	250	1.47	0.29	1.75	0.00	0.26		0.00	0.00	0.00	0.00	0.00
	Haul Truck	0	250	10.03	0.77	3.98	0.03	0.66		0.00	0.00	0.00	0.00	0.00
Concrete Slab pouring	Cement Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Portable Equipment	Generator	2	250	0.30	0.04	0.27	0.00	0.03		150.22	20.66	136.20	0.21	15.20
	Air Compressor	2	250	0.89	0.12	0.50	0.00	0.08		447.14	61.57	252.43	0.58	40.71
Paving	Roller	1	60	5.25	1.37	9.36	n/a	0.64		315.08	82.20	561.60	0.00	38.40
	Surfacing Equipment	1	60	7.57	0.58	3.01	0.02	0.50		454.06	35.02	180.38	1.38	29.95
Architectural Coatings	Air Compressor	2	250	0.89	0.12	0.50	0.00	0.08		447.14	61.57	252.43	0.58	40.71
									Annual Emissions lbs/year	39187.0	3562.8	16770.7	96.8	3102.3
									Annual Emissions TPY	**19.59**	**1.78**	**8.39**	**0.05**	**1.55**

[1] Construction Equipment Exhaust Emission Factors, Based on EPA NONROAD emission rates, 8 hours of operation per day

Table E-15
Annual Site Preparation and Demolition Particulate Emissions for Construction: NAS Jacksonville

Activity	Acres	Site Preparation: Topsoil Removal (lbs)	Site Preparation: Earthmoving (lbs)	Vehicles (lbs)	Emissions (lbs/yr)	Emissions (tons/yr)
All Alternatives	25.85	3,241.58	682.44	1,592.36	5516	2.76

Notes:

Emission factors obtained from EPA-450/2-92-004 Fugitive Dust document (U.S. Environmental Protection Agency September 1992)

Factors for	Topsoil Removal	5.70	kg/VKT
	Earth Moving	1.20	kg/VKT
	Vehicles	2.80	kg/VKT

Assume vehicle kilometers traveled (VKT) per acre:

Alternative 1 10 km

EPA 1992 Fugitive Dust Background document (EPA-450/2-92-004) used as data reference.

Table E-16
Annual VOC Emissions from Paving

Activity	Acres Paved	Emission Factor (lbs/acre/day)[1]	EMISSIONS: LBS/YR	EMISSIONS: TPY
All Alternatives	2.92	2.62	1913.5	0.96

[1]El Dorado County APCD-- CEQA Guide, February, 2000

TABLE E-17
Annual VOC Emissions from Architectural Coatings

Activity	Sq ft surfaces[1]	Est. Paint Qty (gal)[2]	Avg VOC Content (lb/gal)	EMISSIONS: LBS/YR	EMISSIONS: TPY
All Alternatives	8,713.60	29	5	145	0.07

Notes:

[1]assumes 3.20 sq ft of painted surface for each builtor renovated sq ft.

[2]assumes one gallon covers 300 sq ft

Table E-18
Emissions from On Road Vehicle Activity During Construction, NAS Jacksonville

Source	Number of daily trips	Number of days[1]	Total number of trips	Average trip distance (miles)	Total Annual Miles	Emissions TPY[2]						
						VOC	CO	NOx	SO2	CO2	PM_{10}	$PM_{2.5}$
All Alternatives												
Worker Commute	30	250	7500	25	187,500	0.233	2.190	0.169	-	90.946	0.646	0.071
Concrete Delivery			804	25	20,112	0.006	0.024	0.178	0.003	30.973	0.073	0.011
Delivery Truck Traffic	4	250	1000	25	25,000	0.008	0.030	0.222	0.004	38.500	0.091	0.014
						0.247	**2.245**	**0.569**	**0.008**	**160.419**	**0.809**	**0.097**

[1] Assumes all construction activities will be performed within one year.

[2] Calculated using EPA420-F-05-22(EPA 2008)emission rates (see Table E-11)

Table E-19
MMA Facility Construction - NAS Whidbey Island

Alternative	total sq ft	Acres
Alternative 1		
New Construction Area	145,949.00	3.35
Impervious Surface (Paving)	433,514.00	9.95
Total graded space	579,463.00	13.30
Demolition	62,513.00	1.44
Alternative 2		
New Construction Area	247,944.00	5.69
Impervious Surface (Paving)	693,514.00	15.92
Total graded space	1,003,971.00	23.05
Demolition	62,513.00	1.44

and may differ from acreage estimates in Chapter 2 which were developed using GIS. Emission

Table E-20
Mobile Equipment Exhaust Emissions Alternative 1: NAS Whidbey Island

		Equipment	Days	Emission Factors (lb/day)[1]						Emissions (lbs/year)				
Activity	Equipment List	quantity	Used	NOx	VOC	CO	SO_2	PM_{10}		NOx	VOC	CO	SO_2	PM^{10}
Backhoe Excavation	Backhoe Loader	1	250	1.47	0.29	1.75	0.00	0.26		366.32	73.65	436.90	0.57	65.02
	Haul Truck	1	250	10.03	0.77	3.98	0.03	0.66		2507.29	193.36	996.05	7.63	165.37
Cut and fill	Scraper	1	250	7.57	0.58	3.01	0.02	0.50		1891.92	145.90	751.58	5.76	124.78
	Bulldozer	1	250	3.98	0.34	1.63	0.01	0.39		994.51	84.13	408.42	2.45	98.43
	Water Truck	1	250	10.03	0.77	3.98	0.03	0.66		2507.29	193.36	996.05	7.63	165.37
Trenching	Trencher	1	250	7.44	0.89	3.13	0.01	0.65		1859.81	221.83	782.02	1.79	161.33
	Track loader	1	250	1.47	0.29	1.75	0.00	0.26		366.32	73.65	436.90	0.57	65.02
Grading	Grader	1	250	8.74	0.78	1.94	0.01	0.78		2184.13	194.14	485.36	2.91	194.14
	Bulldozer	1	250	3.98	0.34	1.63	0.01	0.39		994.51	84.13	408.42	2.45	98.43
	Water Truck	1	250	10.03	0.77	3.98	0.03	0.66		2507.29	193.36	996.05	7.63	165.37
Demolition	Backhoe Loader	1	250	1.47	0.29	1.75	0.00	0.26		366.32	73.65	436.90	0.57	65.02
	Haul Truck	1	250	10.03	0.77	3.98	0.03	0.66		2507.29	193.36	996.05	7.63	165.37
Concrete Slab pouring	Cement Truck	1	250	10.03	0.77	3.98	0.03	0.66		2507.29	193.36	996.05	7.63	165.37
Portable Equipment	Generator	1	250	0.30	0.04	0.27	0.00	0.03		75.11	10.33	68.10	0.11	7.60
	Air Compressor	1	250	0.89	0.12	0.50	0.00	0.08		223.57	30.78	126.22	0.29	20.35
Paving	Roller	1	250	5.25	1.37	9.36	n/a	0.64		1312.82	342.50	2340.00	0.00	160.00
	Surfacing Equipment	1	250	7.57	0.58	3.01	0.02	0.50		1891.92	145.90	751.58	5.76	124.78
Architectural Coatings	Air Compressor	1	250	0.89	0.12	0.50	0.00	0.08		223.57	30.78	126.22	0.29	20.35
									Annual Emissions lbs/year	25287.3	2478.2	12538.9	61.7	2032.1
									Annual Emissions TPY	**12.64**	**1.24**	**6.27**	**0.03**	**1.02**

Notes:

[1] Construction Equipment Exhaust Emission Factors, Based on EPA NONROAD emission rates (See Table E-11), 8 hours of operation per day

Table E-21
Mobile Equipment Exhaust Emissions Alternative 2: NAS Whidbey Island

		Equipment	Days	Emission Factors (lb/day)[1]						Emissions (lbs/year)				
Activity	Equipment List	quantity	Used	NOx	VOC	CO	SO_2[2]	PM_{10}		NOx	VOC	CO	SO_2	PM_{10}
Backhoe Excavation	Backhoe Loader	2	250	1.47	0.29	1.75	0.00	0.26		732.64	147.30	873.81	1.14	130.04
	Haul Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Cut and fill	Scraper	2	250	7.57	0.58	3.01	0.02	0.50		3783.83	291.80	1503.17	11.52	249.57
	Bulldozer	2	250	3.98	0.34	1.63	0.01	0.39		1989.01	168.27	816.84	4.90	196.86
	Water Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Trenching	Trencher	2	250	7.44	0.89	3.13	0.01	0.65		3719.63	443.67	1564.04	3.59	322.67
	Track loader	2	250	1.47	0.29	1.75	0.00	0.26		732.64	147.30	873.81	1.14	130.04
Grading	Grader	2	250	8.74	0.78	1.94	0.01	0.78		4368.25	388.29	970.72	5.82	388.29
	Bulldozer	2	250	3.98	0.34	1.63	0.01	0.39		1989.01	168.27	816.84	4.90	196.86
	Water Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Demolition	Backhoe Loader	2	250	1.47	0.29	1.75	0.00	0.26		732.64	147.30	873.81	1.14	130.04
	Haul Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Concrete Slab pouring	Cement Truck	2	250	10.03	0.77	3.98	0.03	0.66		5014.58	386.72	1992.09	15.27	330.74
Portable Equipment	Generator	2	250	0.30	0.04	0.27	0.00	0.03		150.22	20.66	136.20	0.21	15.20
	Air Compressor	2	250	0.89	0.12	0.50	0.00	0.08		447.14	61.57	252.43	0.58	40.71
Paving	Roller	2	250	5.25	1.37	9.36	n/a	0.64		2625.64	685.00	4680.00	0.00	320.00
	Surfacing Equipment	2	250	7.57	0.58	3.01	0.02	0.50		3783.83	291.80	1503.17	11.52	249.57
Architectural Coatings	Air Compressor	2	250	0.89	0.12	0.50	0.00	0.08		447.14	61.57	252.43	0.58	40.71
									Annual Emissions lbs/year	50574.5	4956.4	25077.7	123.4	4064.3
									Annual Emissions TPY	**25.29**	**2.48**	**12.54**	**0.06**	**2.03**

Notes:
[1] Construction Equipment Exhaust Emission Factors, Based on EPA NONROAD emission rates (See Table E-11), 8 hours of operation per day

Table E-22
Annual Site Preparation and Demolition Particulate Emissions for Construction: NAS Whidbey Island

			Site Preparation			EMISSIONS	
		ACTIVITY	BULLDOZING	PAN SCRAPING SOIL REMOVAL	PAN SCRAPING		
Activity	ACRES	DAYS	(LBS)	(LBS)	EARTHMOVING (LBS)	LBS/YR	TPY
Alternative 1	13.30	250	1500	213	134	1847	0.92
Alternative 2	23.05	250	1500	369	233	2101	1.05

Demolition							
		Floor Space To be demolished (SQ FT)	Emission from Structure removal (LBS)	Emissions from Debris removal (LBS)	Emissions from Vehicle Activity (LBS)	Total PM10 emissions LBS/YR	Total PM10 emissions TPY
Alternative 1		62,513	31.9	587.6	6654.5	7274.0	3.6
Alternative 2		62,513	31.9	587.6	6654.5	7274.0	3.6

Notes:

Bulldozing dust emissions based on 8hr/activity day * EF (EPA 1992)

Soil removal dust emissions based on VMT/acre *acres*EF (EPA 1992)

EPA 1992 Fugitive Dust Background document (EPA-450/2-92-004) used as data reference.

Table E-23
Annual VOC Emissions from Paving

		Emission Factor	EMISSIONS	
Activity	Acres Paved	(lbs/acre/day)[1]	LBS/YR	TPY
Alternative 1	9.95	2.62	6518.7	3.26
Alternative 2	15.92	2.62	10428.3	5.21

[1]El Dorado County APCD-- CEQA Guide, February, 2000

TABLE E-24
Annual VOC Emissions from Architectural Coatings

				EMISSIONS	
Activity	Sq ft surfaces[1]	Est. Paint Qty (gal)[2]	Avg VOC Content (lb/gal)	LBS/YR	TPY
Alternative 1	467,036.80	1557	5	7784	3.89
Alternative 2	793,420.80	2645	5	13224	6.61

Notes:

[1]assumes 3.20 sq ft of painted surface for each built sq ft.

[2]assumes one gallon covers 300 sq ft

Table E-25
Emissions from On Road Vehicle Activity During Construction, NAS Whidbey Island

Source	Number of daily trips	Number of days[1]	Total number of trips	Average trip distance (miles)	Total Annual Miles	Emissions TPY[2] VOC	CO	NOx	SO2	CO2	PM_{10}	$PM_{2.5}$
Alternative 1												
Worker Commute	30	125	3750	25	93,750	0.116	1.095	0.085	-	45.473	0.323	0.036
Delivery Truck Traffic	4	125	500	25	12,500	0.004	0.015	0.111	0.002	19.250	0.045	0.007
						0.120	**1.110**	**0.196**	**0.002**	**64.723**	**0.368**	**0.043**
Alternative 2												
Worker Commute	40	250	10000	25	250,000	0.310	2.921	0.226	-	121.261	0.861	0.095
Delivery Truck Traffic	5	150	750	25	18,750	0.006	0.023	0.166	0.003	28.875	0.068	0.011
						0.316	**2.943**	**0.392**	**0.003**	**150.136**	**0.929**	**0.106**

[1] Assumes all construction activities will be performed within one year under Alternative 1, two years for Alternatives 2 and 3.

[2] Calculated using EPA420-F-05-22(EPA 2008)emission rates (see Table E-11)

Table E-26
MMA Facility Construction - MCBH Kaneohe Bay

Alternative	total sq ft	Acres
No Action		0.00
New Construction		0.00
Impervious Surface (Paving)		0.00
Total Area Affected	**0**	**0.00**
Demolition	0	0.00
Alternative 1 and 2		0.00
New Construction	0	0.00
Impervious Surface (Paving)	20,451	0.47
Total Area Affected	**20,451**	**0.47**

Refer to Section 2 of SEIS for Construction Information. Estimated sq ft totals provided by the Navy and may differ from acreage estimates in Chapter 2 which were developed using GIS. Emission calculations assume all construction activities will be performed within one year for Alternatives 1 and 2.

Table E-27

Mobile Equipment Exhaust Emissions Alternative 1 and 2: Kanoehe Bay

		Equipment	Days	Emission Factors (lb/day)[1]						Emissions (lbs/year)				
Activity	Equipment List	quantity	Used	NOx	VOC	CO	SO_2[2]	PM_{10}		NOx	VOC	CO	SO_2	PM_{10}
Backhoe Excavation	Backhoe Loader	1	60	1.47	0.29	1.75	0.00	0.26		87.92	17.68	104.86	0.14	15.61
	Haul Truck	1	60	10.03	0.77	3.98	0.03	0.66		601.75	46.41	239.05	1.83	39.69
Cut and fill	Scraper	1	60	7.57	0.58	3.01	0.02	0.50		454.06	35.02	180.38	1.38	29.95
	Bulldozer	1	60	3.98	0.34	1.63	0.01	0.39		238.68	20.19	98.02	0.59	23.62
	Water Truck	1	60	10.03	0.77	3.98	0.03	0.66		601.75	46.41	239.05	1.83	39.69
Trenching	Trencher	1	60	7.44	0.89	3.13	0.01	0.65		446.36	53.24	187.68	0.43	38.72
	Track loader	1	60	1.47	0.29	1.75	0.00	0.26		87.92	17.68	104.86	0.14	15.61
Grading	Grader	1	60	8.74	0.78	1.94	0.01	0.78		524.19	46.59	116.49	0.70	46.59
	Bulldozer	1	60	3.98	0.34	1.63	0.01	0.39		238.68	20.19	98.02	0.59	23.62
	Water Truck	1	60	10.03	0.77	3.98	0.03	0.66		601.75	46.41	239.05	1.83	39.69
Concrete Slab pouring	Cement Truck	1	60	10.03	0.77	3.98	0.03	0.66		601.75	46.41	239.05	1.83	39.69
Portable Equipment	Generator	1	60	0.89	0.12	0.50	0.00	0.08		53.66	7.39	30.29	0.07	4.89
	Air Compressor	1	60	1.20	0.07	0.36	0.00	0.06		72.11	4.21	21.52	0.12	3.84
Paving	Paving Machine Roller	1	60	2.49	0.25	2.68	0.01	0.36		149.59	15.28	160.62	0.34	21.31
	Surfacing Equipment	1	60	0.89	0.12	0.50	0.00	0.08		53.66	7.39	30.29	0.07	4.89
Architectural Coatings	Air Compressor	1	60	1.20	0.07	0.36	0.00	0.06		72.11	4.21	21.52	0.12	3.84
									Annual Emissions lbs/year	4885.9	434.7	2110.7	12.0	391.2
									Annual Emissions TPY	**2.44**	**0.22**	**1.06**	**0.01**	**0.20**

Notes:

[1] Construction Equipment Exhaust Emission Factors, Based on EPA NONROAD emission rates (See Table E-11), 8 hours of operation per day

Table E-28

Annual Site Preparation Particulate Emissions for Construction: Kaneohe Bay

Activity	Site Preparation					EMISSIONS	
	ACRES	ACTIVITY DAYS	BULLDOZING (LBS)	PAN SCRAPING SOIL REMOV(LBS)	PAN SCRAPING ETHMOVING (LBS)	LBS/YR	TPY
Alternative 1 and 2	0.47	249	1494	8	5	1506	0.75
Demolition							
		Floor Space To be demolished (SQ FT)	Emission from Structure removal (LBS)	Emissions from Debris removal (LBS)	Emissions from Vehicle Activity (LBS)	Total PM_{10} emissions LBS/YR	Total PM_{10} emissions TPY
Alternative 1 and 2		0	0.0	0.0	0.0	0.0	0.0

Notes:

Bulldozing dust emissions based on 8hr/activity day * EF (EPA 1992)

Soil removal dust emissions based on VMT/acre *acres*EF (EPA 1992)

EPA 1992 Fugitive Dust Background document (EPA-450/2-92-004) used as data reference.

Table E-29

Annual VOC Emissions from Paving

Activity	Acres Paved2	Emission Factor (lbs/acre/day)[1]	EMISSIONS	
			LBS/YR	TPY
Alternative 1 and 2	0.47	2.62	307.5	0.154

[1]El Dorado County APCD-- CEQA Guide, February, 2000

Table E-30
Emissions from On Road Vehicle Activity During Construction, MCBH Kanaohe Bay

Source	Number of daily trips	Number of days[1]	Total number of trips	Average trip distance (miles)	Total Annual Miles	Emissions TPY[2]						
						VOC	CO	NOx	SO2	CO2	PM_{10}	$PM_{2.5}$
Alternative 1 and 2												
Worker Commute	10	125	1250	25	31,250	0.039	0.365	0.028	-	15.158	0.108	0.012
Delivery Truck Traffic	1	125	125	25	3,125	0.001	0.004	0.028	0.001	4.813	0.011	0.002
						0.040	**0.369**	**0.056**	**0.001**	**19.970**	**0.119**	**0.014**

[1] Assumes all construction activities will be performed within one year under Alternatives 1 and 2.

[2] Calculated using EPA420-F-05-22(EPA 2008)emission rates (see Table E-11)

F Land Use Compatibility Recommendations

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LAND USE COMPATIBILITY RECOMMENDATIONS

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Land Use Compatibility Recommendations

Land Use		Accident Potential Areas[1]			Noise Levels			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65 to 70 DNL	70 to 75 DNL	75 to 80 DNL	80 to 85 DNL
10	Residential							
11	Household units	NA	NA	NA	N[26]	N[26]	N	N
11.11	Single units; detached	N	N	Y[2]	N[26]	N[26]	N	N
11.12	Single units; semidetached	N	N	N	N[26]	N[26]	N	N
11.13	Single units; attached row	N	N	N	N[26]	N[26]	N	N
11.21	Two units; side-by-side	N	N	N	N[26]	N[26]	N	N
11.22	Two units; one above the other	N	N	N	N[26]	N[26]	N	N
11.31	Apartments; walk up	N	N	N	N[26]	N[26]	N	N
11.32	Apartments; elevator	N	N	N	N[26]	N[26]	N	N
12	Group quarters	N	N	N	N[26]	N[26]	N	N
13	Residential hotels	N	N	N	N[26]	N[26]	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	N[26]	N[26]	N[26]	N
16	Other residential	N	N	N	N[26]	N[26]	N	N
20	Manufacturing [3]							
21	Food and kindred products; manufacturing	N	N	Y[4]	Y	Y[27]	Y[22]	Y[29]
22	Textile mill products; manufacturing	N	N	Y[4]	Y	Y[27]	Y[28]	Y[29]
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	N	N	Y	Y[27]	Y[28]	Y[29]

Land Use Compatibility Recommendations

Land Use		Accident Potential Areas[1]			Noise Levels			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65 to 70 DNL	70 to 75 DNL	75 to 80 DNL	80 to 85 DNL
24	Lumber and wood products (except furniture); manufacturing	N	Y[5]	Y[5]	Y	Y[27]	Y[28]	Y[29]
25	Furniture and fixtures; manufacturing	N	Y[5]	Y[5]	Y	Y[27]	Y[28]	Y[29]
26	Paper and allied products; manufacturing	N	Y[5]	Y[5]	Y	Y[27]	Y[28]	Y[29]
27	Printing, publishing, and allied industries	N	Y[5]	Y[5]	Y	Y[27]	Y[28]	Y[29]
28	Chemicals and allied products; manufacturing	N	N	N	Y	Y[27]	Y[28]	Y[29]
29	Petroleum refining and related industries	N	N	N	Y	Y[27]	Y[28]	Y[29]
30	Manufacturing (cont'd) [3]							Y[29]
31	Rubber and misc. plastic products; manufacturing	N	N	N	Y	Y[27]	Y[28]	Y[29]
32	Stone, clay, and glass products; manufacturing	N	N	Y[5]	Y	Y[27]	Y[28]	Y[29]
33	Primary metal products; manufacturing	N	N	Y[5]	Y	Y[27]	Y[28]	Y[29]
34	Fabricated metal products; manufacturing	N	N	Y[5]	Y	Y[27]	Y[28]	Y[29]
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks; manufacturing	N	N	N	Y	25	30	N
39	Miscellaneous manufacturing	N	Y[6]	Y[6]	Y	Y[27]	Y[28]	Y[29]
40	Transportation, communication and utilities [3,6]					Y[27]		
41	Railroad, rapid rail transit, and street railway transportation	N	Y [3,7]	Y[3]	Y	Y[27]	Y[28]	Y[29]
42	Motor vehicle transportation	N	Y [3,7]	Y[3]	Y	Y[27]	Y[28]	Y[29]
43	Aircraft transportation	N	Y [3,7]	Y[3]	Y	Y[27]	Y[28]	Y[29]

Land Use Compatibility Recommendations

Land Use		Accident Potential Areas[1]			Noise Levels			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65 to 70 DNL	70 to 75 DNL	75 to 80 DNL	80 to 85 DNL
44	Marine craft transportation	N	Y[3,7]	Y[3]	Y	Y[27]	Y[28]	Y[29]
45	Highway and street right-of-way	N	Y[3,7]	Y[3]	Y	Y[27]	Y[28]	Y[29]
46	Automobile parking	N	Y[3,7]	Y[3]	Y	Y[27]	Y[28]	Y[29]
47	Communication	N	Y[3,7]	Y[3]	Y	25,30	30,30	N
48	Utilities	N	Y[3,7]	Y[3]	Y	Y[27]	Y[28]	Y[29]
485	Solid waste disposal (landfills, incineration, etc.)	N	N	N	NA	NA	NA	NA
49	Other transportation, communication, and utilities	N	Y[3,7]	Y[3]	Y	25,30	30,30	N
50	Trade							
51	Wholesale trade	N	Y[5]	Y[5]	Y	Y[27]	Y[28]	Y[29]
52	Retail trade – building materials, hardware, and farm equipment	N	Y[8]	Y[8]	Y	Y[27]	Y[28]	Y[29]
53	Retail trade – shopping centers	N	N[9]	Y[9]	Y	25	30	N
54	Retail trade – food	N	N	Y[10]	Y	25	30	N
55	Retail trade – automotive, marine craft, aircraft, and accessories	N	Y[8]	Y[8]	Y	25	30	N
56	Retail trade – apparel and accessories	N	N	Y[11]	Y	25	30	N
57	Retail trade – furniture, home furnishings, and equipment	N	N	Y[11]	Y	25	30	N
58	Retail trade – eating and drinking establishments	N	N	N	Y	25	30	N
59	Other retail trade	N	N	Y[9]	Y	25	30	N

Land Use Compatibility Recommendations								
Land Use		Accident Potential Areas[1]			Noise Levels			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65 to 70 DNL	70 to 75 DNL	75 to 80 DNL	80 to 85 DNL
60	Services [12]							
61	Finance, insurance, and real estate services	N	N	Y[13]	Y	25	30	N
62	Personal services	N	N	Y[14]	Y	25	30	N
62.4	Cemeteries	N	Y[15]	Y[15]	Y	Y[27]	Y[28]	Y [29,24]
63	Business services	N	N	Y[16]	Y	25	30	N
63.7	Warehousing and storage	N	Y[17]	Y[17]	Y	Y[27]	Y[28]	Y[29]
64	Repair services	N	Y[18]	Y[18]	Y	Y[27]	Y[28]	Y[29]
65	Professional services	N	N	Y[9]	Y	25	30	N
65.1	Hospitals, other medical facilities	N	N	N	25	30	N	N
65.16	Nursing homes	N	N	N	N[26]	N[26]	N	N
66	Contract construction services	N	Y[18]	Y[18]	Y	25	30	N
67	Governmental services	N	N	Y[10]	Y[26]	25	30	N
68	Educational services	N	N	N	25	30	N	N
69	Miscellaneous services	N	N	Y[9]	Y	25	30	N
70	Cultural, entertainment and recreational							
71	Cultural activities (including churches)	N	N	N	25	30	N	N
71.2	Nature exhibits	N	Y[19]	Y[19]	Y[26]	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	25	30	N	N

Land Use Compatibility Recommendations

Land Use		Accident Potential Areas[1]			Noise Levels			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65 to 70 DNL	70 to 75 DNL	75 to 80 DNL	80 to 85 DNL
72.11	Outdoor music shells, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y[31]	Y[31]	N	N
73	Amusements (including fairgrounds, miniature golf, driving ranges, amusement parks)	N	N	Y	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y[18,19]	Y[18,19]	Y[26]	25	30	N
75	Resorts and group camps	N	N	N	Y[26]	Y[26]	N	N
76	Parks	N	Y[18,19]	Y[18,19]	Y[26]	Y[26]	N	N
79	Other cultural, entertainment and recreation	N	Y[18,19]	Y[18,19]	Y[26]	Y[26]	N	N
80	Resource production and extraction							
81	Agriculture (except livestock)	Y[6]	Y[20]	Y[20]	Y[32]	Y[33]	Y[34]	Y[34,35]
81.5, 81.7	Livestock farming and animal breeding	N	Y[20,21]	Y[20,21]	Y[32]	Y[33]	N	N
82	Agricultural related activities	N	Y[20,22]	Y[20,22]	Y[32]	Y[33]	Y[34]	Y[34,35]
83	Forestry activities and related services [23]	N	Y[22]	Y[22]	Y[32]	Y[33]	Y[34]	Y[34,35]
84	Fishing activities and related services [24]	N[24]	Y[22]	Y[22]	Y	Y	Y	Y
85	Mining activities and related services	N	Y[22]	Y[22]	Y	Y	Y	Y
89	Other resource production and extraction	N	Y[22]	Y[22]	Y	Y	Y	Y
90	Other							
91	Undeveloped land	Y	Y	Y	NA	NA	NA	NA
93	Water areas	N[25]	N[25]	N[25]	NA	NA	NA	NA

Source: U.S. Department of the Navy 2008.

Notes:

1. A "Yes" or a "No" designation for compatible land use is to be used only for general comparison. Within each, uses exist where further evaluation may be needed in each category as to whether it is clearly compatible, normally compatible, or not compatible due to the variation of densities of people and structures. In order to assist installations and local governments, general suggestions as to floor/area ratios (FAR) are provided in OPNAVINST 11010.36C as a guide to density in some categories. In general, land use restrictions that limit commercial, services, or industrial buildings or structure occupants to 25 per acre in APZ I and 50 per acre in APZ II are the range of occupancy levels considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people per acre in APZ I, and maximum assemblies of 50 people per acre in APZ II.
2. The suggested maximum density for detached single-family housing is 1 to 2 dwelling units per acre (Du/Ac). In a Planned Unit Development (PUD) of single-family detached units where clustered housing development results in large open areas, this density could possibly be increased, provided the amount of surface area covered by structures does not exceed 20% of the PUD total area. PUD encourages clustered development that leaves large open areas.
3. Other factors to be considered: Labor intensity, structural coverage, explosive characteristics, air pollution, electronic interference with aircraft, height of structures, and potential glare.
4. Maximum FAR of 0.56.
5. Maximum FAR of 0.28 in APZ I and 0.56 in APZ II.
6. No structures (except airfield lighting), buildings or aboveground utility/communications lines should normally be located in clear zone areas on or off the installation. The clear zone is subject to severe restrictions. See NAVFAC P-80.3 or Tri-Service Manual AFM 32-1123(I); TM 5-803-7, NAVFAC P-971 "Airfield and Heliport Planning & Design" dated 17 November 2008 for specific design details.
7. No passenger terminals and no major aboveground transmission lines in APZ I.
8. Maximum FAR of 0.14 in APZ I and 0.28 in APZ II.
9. Maximum FAR of 0.22.
10. Maximum FAR of 0.24.
11. Maximum FAR of 0.28.
12. Low intensity office uses only. Accessory uses such as meeting places, auditoriums, etc., are not recommended.
13. Maximum FAR of 0.22 for "General Office/Office Park."
14. Office uses only. Maximum FAR of 0.22.
15. No chapels are allowed within APZ I or APZ II.
16. Maximum FAR of 0.22 in APZ II.
17. Maximum FAR of 1.0 in APZ I and 2.0 in APZ II.
18. Maximum FAR of 0.11 in APZ I and 0.22 in APZ II.
19. Facilities must be low intensity and provide no tot lots, etc. Facilities such as clubhouses, meeting places, auditoriums, large classes, etc., are not recommended.
20. Includes livestock grazing but excludes feedlots and intensive animal husbandry. Activities that attract concentrations of birds creating a hazard to aircraft operations should be excluded.
21. Includes feedlots and intensive animal husbandry.

22. Maximum FAR of 0.28 in APZ I and 0.56 in APZ II. No activity that produces smoke or glare or involves explosives.
23. Lumber and timber products removed due to establishment, expansion, or maintenance of clear zones will be disposed of in accordance with appropriate DoD Natural Resources Instructions.
24. Controlled hunting and fishing may be permitted for the purpose of wildlife management.
25. Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are compatible.
26. a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-69 and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted prior to approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones.
    b. Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor noise level reduction (NLR) of at least 25 dB (DNL 65-69) and 30 dB (DNL 70-74) should be incorporated into building codes and be considered in individual approvals; for transient housing a NLR of at least 35 dB should be incorporated in DNL 75-79.
    c. Normal permanent construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded Sound Transmission Class (STC) ratings in windows and doors and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.
    d. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design, and use of berms and barriers can help mitigate outdoor exposure, particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures which only protect interior spaces.
27. Measures to achieve an NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
28. Measures to achieve an NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
29. Measures to achieve an NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
30. If the project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.
31. Land use compatible, provided special sound reinforcement systems are installed.
32. Residential buildings require an NLR of 25.
33. Residential buildings require an NLR of 30.
34. Residential buildings not permitted.
35. Land use not recommended, but if the community decides use is necessary, hearing protection devices should be worn by personnel.

Key:

Y (Yes) = Land use and related structures compatible without restrictions.

N (No) = Land use and related structures are not compatible and should be prohibited.

Y^x (Yes with restrictions) = The land use and related structures are generally compatible. However, see notes indicated by superscript.

N^x (No with restrictions) = The land use and related structures are generally incompatible. However, see notes indicated by superscript.

SLUCM = Standard Land Use Coding Manual.

NLR (Noise Level Reduction) = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

DNL = Day-night average sound level.

NA = Not Applicable (no data available for that category).

25, 30, or 35 = Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 must be incorporated into design and construction of structure.

G Coastal Consistency Determination for Home Basing of the P-8A Multi-Mission Maritime Aircraft

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APPENDIX G
COASTAL CONSISTENCY DETERMINATION FOR HOME BASING OF THE P-8A MULTI-MISSION MARITIME AIRCRAFT

NAS JACKSONVILLE, FLORIDA

Introduction

This document provides the State of Florida with the U.S. Department of the Navy's (Navy) Consistency Determination under Section 307 (c) (1) of the federal Coastal Zone Management Act (CZMA) of 1972, as amended, for the proposed home basing of the P-8A Multi-Mission Maritime Aircraft at Naval Air Station (NAS) Jacksonville.

After careful consideration, the Navy has determined that the proposed action will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the Florida Coastal Management Program.

Proposed Federal Agency Action

The Navy needs to home base 12 P-8A squadrons and the FRS and has determined that home basing P-8A squadrons at two locations (rather than three) could provide potential cost savings while still meeting current strategic operational objectives. This SEIS considers home basing P-8A fleet squadrons and the FRS at two locations in order to meet the current requirements of the Navy, maximize the efficiency of support facilities and simulation devices, and optimize the number of personnel required.

The Navy is currently considering two potential alternatives that would home base up to six fleet squadrons and the FRS (54 aircraft) at NAS Jacksonville. The following is a summary of the aircraft and personnel replacements that are proposed under either alternative.

Alternative 1. Alternative 1 considers the environmental effects of home basing P-8A squadrons at two locations: six fleet squadrons and the FRS at NAS Jacksonville and six fleet squadrons at NAS Whidbey Island. Alternative 1 considers a permanent, rotating squadron detachment at MCB Hawaii Kaneohe Bay and periodic squadron detachments at NB Coronado.

Alternative 2. Alternative 2 considers the environmental effects of home basing P-8A squadrons at two locations: five fleet squadrons and the FRS at NAS Jacksonville and seven fleet squadrons at NAS Whidbey Island. Alternative 2 considers a permanent, rotating squadron detachment at MCB Hawaii Kaneohe Bay and periodic squadron detachments at NB Coronado.

No Action Alternative. The No Action Alternative represents current conditions in April 2014 to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 ROD were to occur. The No Action Alternative represents conditions at the time of a new home basing decision:

- At NAS Jacksonville, training facilities and hangars exist to support the P-8A transition. By April 2014, four of six squadrons will have transitioned from P-3C to P-8A aircraft, and the FRS will consist of a combination of P-3C and P-8A aircraft.

- At NAS Whidbey and MCB Hawaii Kaneohe Bay, facilities and functions exist to continue supporting P-3C operations as the P-8A transition has not begun at these locations.

The No Action Alternative does not meet the purpose of and need for the proposed action to provide facilities and functions to home base at two locations; however, the No Action Alternative is carried forward for analysis as it represents a baseline condition against which environmental consequences can be measured.

Previous Action

In 2008, the Navy issued a Record of Decision (ROD) to replace the aging P-3C aircraft with the P-8A at NAS Jacksonville, NAS Whidbey Island, and Marine Corps Base (MCB) Hawaii Kaneohe Bay. Due to current conditions and new information, the Navy is preparing a Supplemental Environmental Impact Statement (SEIS) to consider two new alternatives for home basing the P-8A that were not analyzed in the 2008 EIS prepared under the National Environmental Policy Act. The Navy is preparing an SEIS to include the proposed action of providing facilities and functions to home base the P-8A aircraft at two established maritime patrol home bases. In addition, the SEIS incorporates changes to circumstances at the home base locations, and the latest P-8A program information.

In the 2008 ROD, the Navy determined that five fleet squadrons and the Fleet Replacement Squadron (FRS) would be home based at NAS Jacksonville, four fleet squadrons would be home based at NAS Whidbey Island, and three fleet squadrons would be home based at MCB Hawaii Kaneohe Bay, with periodic squadron detachments for training at Naval Base (NB) Coronado (Alternative 5 in the 2008 FEIS). By April 2014, four of six squadrons at NAS Jacksonville will have transitioned from the P-3C to the P-8A, and the FRS will consist of a combination of P-3C and P-8A aircraft at NAS Jacksonville; no P-8A transitions or related facility improvements would have occurred at NAS Whidbey Island or MCB Hawaii Kaneohe Bay.

Construction of the P-8A trainer facility and associated parking to support the P-8A at NAS Jacksonville was analyzed in the 2008 FEIS. Construction of the trainer and parking is now complete and is supporting the P-8A mission already underway at NAS Jacksonville. A CCD was prepared and appended to the DEIS and 2008 FEIS. The Navy concluded that the proposed action was consistent, to the maximum extent practicable, with the Florida Coastal Management Program. The Florida State Clearinghouse reviewed the DEIS and concurred that the proposed federal activities at NAS Jacksonville were consistent as long as adequate resolution of issues occured during the environmental permitting process.

Overview of NAS Jacksonville

Commissioned on October 15, 1940, NAS Jacksonville occupies 3,896 acres in Jacksonville, Florida (Duval County), west of the St. Johns River and is located approximately 30 miles from the Atlantic Ocean (see Attachment 1). Duval County lies along the northeast coast of Florida and is bordered by Nassau County to the north, Baker County to the west, Clay and St. Johns counties to the south, and the Atlantic Ocean to the east.

NAS Jacksonville serves as the host for the Commander Patrol and Reconnaissance Wing (CPRW) 11 and VP-30, which is the FRS for the P-3C and P-8A. NAS Jacksonville hosts six fleet squadrons of P-3C and P-8A aircraft (VP-8, VP-10, VP-26, VP-5, VP-16, and VP-45), one reserve squadron of P-3C aircraft (VP-62), one reserve logistics squadron of C-40 aircraft (VR-58), one reserve squadron of C-130 aircraft (VR-62), and six SH-60/HH-60/MH-60 helicopter squadrons.

Action Overview at NAS Jacksonville

Alternatives 1 and 2 would both require facility renovation and construction at NAS Jacksonville (see Attachments 2 and 3). The proposed MILCON planning includes one project, in FY 2014. All siting alternatives would require the following:

- Construction of a 1,000-foot-long overrun to the approach end of Runway 10;
- Construction of a parallel taxiway and taxiway connectors for the overrun;
- Construction of a new, 400-foot-long asphalt blast pad at the west end of the overrun;
- Renovation of portions of Hangar 511; and

- Reconfiguration of the existing Combat Aircraft Loading Area (CALA) to accommodate two P-8A aircraft.

Site preparation for all facilities would include site clearing, excavation, and preparation for construction. Paving and site improvements include grading, construction of roadways, and landscaping.

Construction of the 1,000-foot overrun would include installation of runway edge lights, runway threshold lights, runway guard lights, runway centerline lights, and taxiway edge lights. The overrun is required to provide P-8A aircraft with sufficient safety margins when operating fully loaded in low air-density conditions—i.e., on hot and humid days.

Hangar 511 renovations would include interior alterations between Hangar 511 and an adjacent hangar, changes in the interior shop space and other add-ons inside the hangar, reconfiguration of door controls, and reconfiguration of office and shop spaces. Additional P-8A aircraft would be accommodated by the existing P-3C hangar located north of Yorktown Avenue. Enough space exists on the parking apron near the hangar.

Hangar 511 renovations would include interior alterations for a planned tug pull-through lane, changes in the interior adjoining shop space, reconfiguration of door controls, and reconfiguration of office and shop spaces.

Permitting and Environmental Impact Statement

Prior to implementation of the proposed action, all appropriate permits and authorizations will be obtained. A construction NPDES storm water permit will be obtained from the Florida Department of Environmental Protection through their storm water permitting program because more than 1 acre would be disturbed during construction under both action alternatives. Under the permit, the Navy will submit a site-specific Storm Water Pollution Prevention Plan (SWPPP) for new discharges that would include a site plan for managing storm water runoff and that describes the best management practices (BMPs) to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollutants.

As part of the effects determination for the proposed action, the Navy is consulting with the Florida SHPO and federally recognized Indian tribes regarding potential direct and indirect effects of proposed construction activities on historic properties at NAS Jacksonville pursuant to Section 106 of the NHPA and implementing regulations for Section 106 at 36 CFR Part 800.

The Navy published a draft SEIS in September 2013 for the proposed action. The Coastal Consistency Determination is an appendix to the draft SEIS.

Background

The CZMA, enacted in 1972, created the National Coastal Management Program for management and control of the uses of and impacts on coastal zone resources. The program is implemented through federally approved state coastal management programs (CMPs).

Federal approval of a state CMP triggers the CZMA Section 307 federal consistency determination requirement. Section 307 mandates that federal actions within a state's coastal zone (or outside the coastal zone if the action affects land or water uses or natural resources within the coastal zone) be consistent to the maximum extent practicable with the enforceable policies of the state CMP. A Federal agency considering actions that may impact waters governed by the CZMA uses these requirements to ensure compliance with the state's federally approved coastal management program. Federal agency actions include direct and indirect federal agency activities, federal approval activities, and federal financial assistance activities. Accordingly, federal agency activities (direct, indirect, or cumulative) reasonably affecting the state's coastal zone must be fully consistent with the enforceable policies of the state's CMP, unless compliance is otherwise prohibited by law. There are no categorical exemptions or exclusions to or from the Section 307 federal consistency requirement.

The first step is the CZMA federal consistency process is to determine whether the proposed action will have a "reasonably foreseeable direct, indirect, or cumulative effect on a state's coastal uses or resources" (U.S. Department of the Navy n.d.). This is called an "effects test." After conducting an effects test, the Navy determined the proposed action may result in reasonably foreseeable direct, indirect, or cumulative effects on Florida's coastal uses or resources; therefore, the Navy has prepared a coastal consistency determination.

The Florida Coastal Management Program (FCMP), approved by the National Oceanic Atmospheric Administration in 1981, manages over 8,000 miles of coastline through the authority granted by the Florida Legislature in 24 different statutes. This network of statutes is administered by nine state agencies, including all of the water management districts, throughout the state of Florida. Each FCMP state agency must ensure that federal activities within the state comply with the requirements of the specific FCMP statutes and authorities within its jurisdiction. The FCMP includes enforceable policies that ensure the wise use and protection of the state's water, cultural, historic and biological resources; minimize the state's vulnerability to coastal hazards; ensure compliance with the state's growth management laws; protect the state transportation system; and protect the state's proprietary interest as the owner of sovereignty submerged lands.

Enforceable Policies Not Applicable to the Proposed Action

The Navy reviewed the FCMP to identify enforceable policies relevant to the proposed action, approved as part of the coastal program, and enforceable on the Navy's proposed action. The FCMP policies that are not applicable to the proposed action are identified and discussed in Table 1.

Table 1: FCMP Statutes Not Applicable to the Proposed Action

Enforceable Policy	Explanation of Non-Applicability
Chapter 161 – Beach and Shore Preservation	The proposed action would not include construction within or adjacent to any beach or shoreline regulated by the Coastal Construction Permit Program, the Coastal Construction Control Line (CCCL) Permit Program, or the Coastal Zone Protection Program, and would not affect shorelines or shoreline processes.
Chapter 252 – Emergency Management	The proposed action would not affect emergency response and evacuation procedures, and adequate flood control for residents of the region will remain unchanged.
Chapter 253 – State Lands	The proposed action would occur entirely on federal property and would have no effect on state lands.
Chapters 258, 259, 260, and 375 – State Parks and Preserves; Land Acquisition for Conservation or Recreation; Florida Greenway and Trails Act; Outdoor Recreation and Conservation Lands	The proposed action would occur entirely on federal property. No state parks, state trails, state aquatic preserves, or wild and scenic river segments would be affected by the proposed action, and opportunities for recreation on state lands would not be affected.
Chapters 334 and 339 – Transportation Administration; Transportation Finance and Planning	The proposed action would not affect the existing transportation systems within the area under either of the alternatives.
Chapter 376 – Pollutant Discharge Prevention and Removal	The proposed action would create no changes to the handling, use, storage, or disposal of fuel, oils, and lubricants at NAS Jacksonville.

Table 1: FCMP Statutes Not Applicable to the Proposed Action

Enforceable Policy	Explanation of Non-Applicability
Chapter 381 – Public Health	The proposed action would not affect the state's policy concerning the public health system.
Chapter 388 – Mosquito Control	The proposed action would not further the propagation of mosquitoes and would not affect mosquito control efforts.
Chapter 553 – Building and Construction Standards	Hangar 511 is a structure that already exists, and all proposed renovations to Hangar 511 would be small in scale. No new buildings would be constructed, and therefore building standards would not apply.
Chapter 597 - Aquaculture	Aquaculture facilities would not be constructed and aquatic resources supporting aquaculture activities would not be affected.

CHAPTER 163 (part II) – GROWTH POLICY, COUNTY AND MUNICIPAL PLANNING, LAND DEVELOPMENT REGULATIONS

This statute establishes the implementation of comprehensive planning programs to guide and control future development in the state. Local governments are encouraged to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with public interest, and to adopt county-wide marine siting plans. The comprehensive planning process encourages units of local government to preserve, promote, protect, and improve the public health, safety, comfort, good, order, appearance, convenience, law enforcement and fire prevention, and general welfare; prevent the overcrowding of land and avoid undue concentration of population; facilitate the adequate and efficient provision of public facilities and services; and conserve, develop, utilize, and protect natural resources within their jurisdictions.

The proposed action is being coordinated with various local agencies and municipalities through the NEPA process and other permit evaluations. The City of Jacksonville 2030 Comprehensive Plan supports and encourages an expanded economic base, including expansion of NAS Jacksonville. In addition, the plan recognizes the Navy's Air Installations Compatible Use Zones (AICUZ) Program and recommends land use development that is compatible with aircraft operations. The Navy would continue to work with the City of Jacksonville to plan for compatible land use development within the projected noise zones under both home basing alternatives at NAS Jacksonville.

The proposed action meets the intent of this statute by planning for the most appropriate use of land and natural resources in a manner consistent with the public interest. Therefore, the proposed action is fully consistent with the enforceable policy.

CHAPTER 186 – STATE AND REGIONAL PLANNING

This chapter establishes the State Comprehensive Plan (SCP) and details state-level and regional planning requirements. The SCP sets goals that articulate a strategic vision of the State's future governing water use, land development, and transportation. Its purpose is to broadly define goals and policies that provide decision-makers directions for the future, and provides long-range guidance for orderly social, economic, and physical growth. The goals, objectives, and policies of the SCP are statewide in scope and are consistent and compatible with each other.

The proposed action is being coordinated with various Federal, State, and Regional agencies through the NEPA process and other regulatory permit evaluations. State and regional agencies will be provided the opportunity to review the SEIS for compatibility. The proposed action is consistent with state and regional planning as it occurs entirely on federal property and conforms to the SCP and associated plans, including the State Land Development Plan, the Florida Water Plan, and the Florida Transportation Plan.

The proposed action is fully consistent with the enforceable policy by adhering to a long-range plan, which would support the continued orderly social, economic, and physical growth of the region.

CHAPTER 267 – HISTORICAL RESOURCES

This statute addresses the management and preservation of the state's archaeological and historical resources. This statute recognizes the state's rich and unique heritage of historic resources and directs the state to locate, acquire, protect, preserve, operate and interpret historic and archeological resources for the benefit of current and future generations of Floridians. Objects or artifacts with intrinsic historic or archeological value located on, or abandoned on, state-owned lands or state-owned submerged lands belong to the citizens of the state. The state historic preservation program operates in conjunction with the National Historic Preservation Act of 1966 to require state and federal agencies to consider the effect of their direct or indirect actions on historic and archeological resources. These resources cannot be destroyed or altered unless no prudent alternative exists, and unavoidable impacts must be mitigated.

An intensive archaeological site assessment survey and inventory was conducted at NAS Jacksonville in 1997, which included the APE for the proposed action. No archaeological resources were identified within the APE at NAS Jacksonville, and no previously identified Native American resources are present within the APE at NAS Jacksonville.

There are two architectural or built resources associated with the APE for the proposed action at NAS Jacksonville: Hangar 511 and the CALA. The Navy defines buildings and structures according to the definitions provided in National Register Bulletin 16A – How to Complete the National Register Registration Form. According to these definitions, Hangar 511 and the CALA are both considered structures.

The 2010 ICRMP for NAS Jacksonville indicated that neither of the two built resources within the APE has been evaluated for NRHP-eligibility. Hangar 511 is an existing structure that was built in 2009 and would not be NRHP-eligible due to its age (four years old). The other built resource, the CALA, is also an existing structure (a paved area with markings, lighting and tie-downs) and is located along the eastern side of Taxiway Charlie. The CALA's location along the eastern side of Taxiway Charlie suggests that it may be associated with the taxiway. Built in 1944, the CALA has been recommended for NRHP-eligibility evaluation. Surface modification, including remarking and relocation of lighting and tie-downs, would have no impacts on the structural integrity of the CALA.

The two proposed action alternatives would result in direct impacts on one architectural resource, Hangar 511, due to renovations that would reconfigure a portion of the interior for use by P-8A aircraft. Surface modification, including remarking and relocation of lighting and tie-downs, would have no impacts on the structural integrity of the CALA. As part of the effects determination for the current proposed action, the Navy is consulting with the Florida SHPO regarding potential direct and indirect effects of proposed construction activities on architectural resources at NAS Jacksonville pursuant to Section 106 of the NHPA and implementing regulations for Section 106 at 36 CFR Part 800..

The proposed action is consistent to the maximum extent practicable with the enforceable policy.

CHAPTER 288 – COMMERCIAL DEVELOPMENT AND CAPITAL IMPROVEMENTS

The statute includes requirements to protect and promote the natural, coastal, historical, and cultural tourism assets of the state; foster the development of nature-based tourism and recreation; and upgrade the image of Florida as a quality destination. Natural resource-based tourism and recreational activities are critical sectors of Florida's economy, and the needs of the environment must be balanced with the need for growth and economic development. Statutory changes in 2012 remove conditions related to encouraging economic development within different communities, and add enforceable conditions related to planning development in an area newly opened to development, or needing redevelopment, by the closure of a federal military base. More specifically, this statute now provides for the regulation and guidance to local governments regarding planning and economic issues that may arise with the closure of a military base when the land converts to another use, and coordinates local governments and impacts to the environment, public services, and populace through advanced growth management planning, expedited permitting, and employment placement services.

Implementation of Alternatives 1 and 2 would require construction and renovation of facilities at NAS Jacksonville to accommodate the P-8A aircraft. Both alternatives would require $20.8 million in construction expenditures. Construction is assumed to take place during FY 2015. A number of jobs would be generated directly from these construction expenditures and indirectly from the increased economic activity in the area. The proposed action would generate an estimated 272 jobs and $10.8 million employee earnings during construction. Because these construction dollars represent a one-time expenditure, the resulting positive economic impacts would last only a short time. Once these funds leave the regional economy through savings, taxes, or purchases of goods and services outside the region, the positive effects would no longer be multiplied. Implementation of the action alternatives would not result in significant changes in socioeconomic characteristics from the decrease in personnel levels at NAS Jacksonville. The decrease in personnel loading represents a decrease in the population of Duval County of no more than 0.2 percent under either of the alternatives. The local housing market would be expected to recover from any short-term effects of the small decrease in personnel. Construction would have a short-term positive economic effect; however, the small personnel-level decreases would result in slight long-term reduction of employee earnings and spending in the region. These changes would result in minor changes to the regional economy under Alternatives 1 and 2. NAS Jacksonville will remain an active military base and planning for economic or environmental impacts related to its closure is unnecessary.

The proposed action is consistent to the maximum extent practicable with the enforceable policy because it would occur on federal property and is not expected to have a major effect on future business opportunities or tourism.

CHAPTER 373 – WATER RESOURCES

This chapter provides authority to regulate the withdrawal, diversion, storage, and consumption of water. The waters in the state of Florida are managed and protected to conserve and preserve water resources, water quality, and environmental quality. This statute addresses sustainable water management; the conservation of surface and ground waters for full beneficial use; the preservation of natural resources, fish, and wildlife; protecting public land; and promoting the health and general welfare of Floridians. The state manages and conserves water and related natural resources by determining whether activities will unreasonably consume water; degrade water quality; or adversely affect environmental values such as protected species habitat, recreational pursuits, and marine productivity. Statutory changes in 2012 allow reclaimed water to be more widely utilized, prohibit water management districts from requiring a consumptive use permit for the use of reclaimed water, and provide consistency across regional boundaries while still taking into account protections for regional, physical, or natural characteristics.

Specifically, under Part IV of Chapter 373, the Department of Environmental Protection, water management districts, and delegated local governments review and take action on wetland resource, environmental resource, and stormwater permit applications, which address the construction, alteration, operation, maintenance, abandonment, and removal of any stormwater management system, dam, impoundment, reservoir, or appurtenant work or works, including dredging, filling and construction activities in, on, and over wetlands and other surface waters.

Construction of facilities to support the continued home basing of P-8A aircraft at NAS Jacksonville would disturb approximately 36.10 acres of land. Storm water runoff from the construction site could potentially affect water quality in the lower St. Johns River basin through the introduction of sediments, particulates, and various constituents. A construction NPDES storm water permit would be obtained from the Florida Department of Environmental Protection through their storm water permitting program because more than 1 acre would be disturbed during construction under both of the action alternatives. Under the permit, the Navy would submit a site-specific SWPPP for new discharges that would include a site plan for managing storm water runoff and that describes the BMPs to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollutants. Examples of storm water BMPs that may be used include:

- Temporary sediment basins. Structures designed to detain sediment-laden runoff from disturbed areas long enough for sediments to settle out and control the release of storm water;

- Silt fencing. A temporary erosion and sediment control used to prevent dirt from entering waterways before bare soil is stabilized with vegetation; and

- Berms. A temporary erosion and sediment control that physically prevents polluted runoff from entering nearby storm drain inlets and waters.

The new construction to support the continued transition of P-3C aircraft to P-8A aircraft would create approximately 12.89 acres of new impervious surface under all the action alternatives. This surface would, on the average, generate an additional 15.3 million gallons of runoff per year. Once the facilities are constructed, storm water from the new impervious surface would be directed to an existing storm water conveyance system via sheet flow or grass-lined swales. Based on discussion with NAS

Jacksonville natural resources personnel, additional stormwater runoff would be directed to an existing storm water detention pond located approximately 2,000 feet from the end of the proposed overrun. Storm water discharge would comply with the conditions of the NPDES permit; therefore, the construction at the station under the proposed action alternatives would not significantly affect water quality. Under the No Action Alternative, no additional facilities would be constructed to support the P-8A operations; therefore, there would be no changes in water quality.

The proposed action would not affect the base flood elevation of the lower St. Johns River at NAS Jacksonville under either of the action alternatives because the mapped 100-year floodplain does not extend within or adjacent to the proposed construction area. Under the No Action Alternative, no additional facilities would be constructed to support the P- 8A operations; therefore, floodplains would not be affected.

The proposed action would not affect groundwater resources in the vicinity of NAS Jacksonville. None of the proposed construction at the station would extend below surface at a depth that would impact the Floridan aquifer that is used for drinking water. Although fuel or other chemicals could be spilled during construction, immediate cleanup of these spills would prevent any infiltration into the underlying groundwater. Since the number of personnel employed or stationed at NAS Jacksonville would decrease between 16 and 26 percent under the action alternatives, there would be a corresponding decrease in the demand for groundwater from the regional aquifer system. Therefore, the construction and operational changes to support the continued transition of P-3C aircraft to P-8A aircraft at the station under the proposed action alternatives would not have a significant effect on groundwater resources. Under the No Action Alternative no additional facilities would be constructed to support the P-8A operations; therefore, groundwater resources would not be affected.

No in-water construction would be required under the proposed action. In addition, no water bodies are present within or adjacent to the proposed construction areas; therefore, the proposed action would have no direct effects on surface waters. The proposed action would have no effect on wetlands at NAS Jacksonville under either of the action alternatives because no wetlands are located on or adjacent to the proposed construction areas.

Construction will be performed in compliance with state general construction stormwater permit requirements. Furthermore, a SWMP and BMPs will be implemented to limit erosion and runoff. Groundwater used for drinking water, floodplains, and wetlands would not be directly impacted. With proper implementation of the SWPPP, impacts on water quality from erosion and off-site sedimentation would be negligible.

The proposed action would be consistent to the maximum extent practicable with the enforceable policy.

CHAPTER 375 – OUTDOOR RECREATION AND CONSERVATION LANDS

This statute addresses the development of a comprehensive multipurpose outdoor recreation plan and establishes a Land Acquisition Trust Fund. The purpose of the recreation plan is to document recreational supply and demand, describe current recreational opportunities, estimate the need for additional recreational opportunities, and propose the means to meet the identified needs. This chapter authorizes the identification for acquisition, lands, water areas, and related resources and to perform all other activities necessary or incident to improving, maintaining, selling, leasing, or disposing of land, water areas, and related resources, and improvements thereon. The state is authorized to acquire any land, water areas, related resources, or other property which it deems is reasonably necessary for outdoor recreation or natural resources conservation including any public lands, parks, playgrounds, reservations, roads, or parkways. Consistency with this statute includes ensuring no damage to or destruction of trees, flora, sand dunes or other environmentally sensitive land, roads, trails, drainage systems or natural water courses or sources, wildlife resources, fences or gates, or crops or cultivated land.

The proposed action would not affect any outdoor recreational areas or water areas and/or resources, including floodways, parks, and navigational channels.

The proposed action is therefore fully consistent with the enforceable policy and will not cause damage to, or destruction of, environmentally sensitive lands, farmland, or water systems.

CHAPTER 377 – ENERGY RESOURCES

This statute addresses the regulation, planning, and development of the energy resources of the state and provides policy to conserve and control the oil and gas resources in the state, including products made therefrom and to safeguard the health, property and welfare of Floridians. The Department of Environmental Protection (DEP) is authorized to regulate all phases of exploration, drilling, and production of oil, gas, and other petroleum products in the state. The statute describes the permitting requirements and criteria necessary to drill and develop for oil and gas. DEP rules ensure that all precautions are taken to prevent the spillage of oil or any other pollutant in all phases of extraction and transportation. The state explicitly prohibits pollution resulting from drilling and production activities. No person drilling for or producing oil, gas, or other petroleum products may pollute land or water; damage aquatic or marine life, wildlife, birds, or public or private property; or allow any extraneous matter to enter or damage any mineral or freshwater-bearing formation.

There will be a slight decrease in personnel at NAS Jacksonville which may cause a corresponding slight reduction in the use of electricity and heating. The proposed action does not involve the exploration, drilling, or production of gas, oil, or petroleum products, and is therefore fully consistent with enforceable policy.

CHAPTER 379 – FISH AND WILDLIFE CONSERVATION

This statute addresses the management and protection Florida's wide diversity of fish and wildlife resources. It is the policy of the state to conserve and wisely manage these resources. Particular attention is given to those species defined as being endangered or threatened. This includes the acquisition or management of lands important to the conservation of fish and wildlife. This statute contains specific provisions for the conservation and management of marine fisheries resources. These conservation and management measures permit reasonable means and quantities of annual harvest, consistent with maximum practicable sustainable stock abundance, as well as ensure the proper quality control of marine resources that enter commerce. Additionally, this statute supports and promotes hunting, fishing and the taking of game opportunities in the State. Hunting, fishing, and the taking of game are considered an important part in the state's economy and in the conservation, preservation, and management of the state's natural areas and resources.

The maintained grassland that would be affected by the proposed construction supports a limited diversity or abundance of terrestrial wildlife. Direct effects could include mortality of less-mobile species such as small mammals, reptiles, and amphibians. The loss of approximately 12.89 acres of maintained grassland could cause the migration of these species to other areas, indirectly resulting in a decrease in the number of wildlife species in the area. However, the overall loss of wildlife species would be undetectable at a population level, given the relatively large amount of suitable habitat that would remain near the proposed facilities.

Annual aircraft operations would decrease, and noise levels would increase slightly compared to baseline conditions under either of the action alternatives. Given the nature of the current NAS Jacksonville operations, locally occurring wildlife species have likely become habituated to aircraft noise at NAS Jacksonville. Studies that focus on investigating the impacts of aircraft noise on wildlife and domestic animal species have observed a variety of species, including waterfowl, shore birds, songbirds, terrestrial mammals, and domestic animals (cows, chickens, sheep, and horses). Overall, the studies suggest that species differ in their response to aircraft noise (Manci et al. 1988). All species not exposed to aircraft noise, however, seem to initially respond with some form of a startle response, the intensity and duration of which diminishes or disappears with subsequent exposures. Other general responses include running, stampeding, flying, circling, or becoming motionless. Several studies indicate that there is a strong tendency for species to acclimate or habituate to noise disturbances (Black et al. 1984; Fraser et al. 1985; Manci et al. 1988; Ellis et al. 1991; Grubb and King 1991). Consequently, given the nature of the current

NAS Jacksonville operations, the proposed action would not significantly affect wildlife at or in the vicinity of NAS Jacksonville with aircraft noise. Wildlife would not be affected under the No Action Alternative because no additional facilities would be constructed and baseline aircraft operations would not change.

Overall, implementation of the proposed action at NAS Jacksonville would not result in significant effects to biological resources. Proposed construction activities would affect already actively managed areas; no unique or critical vegetation habitats would be affected. Short-term noise increases from construction would temporarily displace wildlife and migratory birds. Noise levels associated with aircraft operations under either of the action alternatives would not result in significant effects to wildlife and migratory birds, including any ESA-listed species, because overall noise levels at NAS Jacksonville would not significantly increase compared to baseline conditions.

The proposed action is fully consistent with the enforceable policy.

CHAPTER 380 – LAND AND WATER MANAGEMENT

Land and water management policies are established by this statute to protect natural resources and the environment, and to guide and coordinate local decisions relating to growth and development. It establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. The statute provides that state land and water management policies, to the maximum possible extent, be implemented by local governments through existing processes for the guidance of growth and development and that all the existing rights of private property be preserved in accord with constitutions of this state and of the United States. The chapter establishes the Areas of Critical State Concern designation, the Florida Communities Trust as well as the Florida Coastal Management Act. The Florida Coastal Management Act provides the basis for the Florida Coastal Management Program which seeks to protect the natural, commercial, recreational, ecological, industrial, and aesthetic resources of Florida's coast.

Construction of new facilities at NAS Jacksonville under the proposed action alternatives would result in the permanent loss of approximately 12.89 acres of herbaceous vegetation (Bahia grass) that is regularly mowed as part of the airfield clear zone management program. The vegetation permanently removed for the proposed action would total less than 1 percent of the currently vegetated area at the station. The affected vegetation community is not considered unique or regionally significant at NAS Jacksonville. As such, environmental consequences of the implementation of the P-8A would not significantly affect vegetation at NAS Jacksonville. Under the No Action Alternative, no additional facilities would be constructed to support the proposed operations of P-8A aircraft; therefore, vegetation would be unchanged..

The proposed action is fully consistent with the enforceable policy because it would occur on federally owned lands, and development of state lands with regional (i.e., more than one county) effects would not occur. Areas of Critical State Concern or areas with approved state resource management plans would not be affected. Changes to coastal infrastructure such as bridge construction, capacity increases for coastal infrastructure, or use of state funds for infrastructure planning, designing, or construction would not occur.

CHAPTER 403 – ENVIRONMENTAL CONTROL

This chapter establishes public policy concerning environmental control in the state, and authorizes the regulation of pollution of the air and waters. Environmental control policies conserve state waters; protect and improve water quality for consumption and for the propagation of fish and wildlife; and maintain air quality to protect human health and plant and animal life. This statute provides wide-ranging authority to address various environmental control concerns, including air and water pollution; electrical power plant and transmission line siting; the Interstate Environmental Control Compact; resource recovery and management; solid and hazardous waste management; drinking water protection; pollution prevention; ecosystem management; and natural gas transmission pipeline siting. Statutory changes in

2012 require the establishment of reasonable zones of mixing for discharges into specified waters and specify that certain discharges do not create liability for site cleanup.

An SEIS addressing action impacts will be reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. The Conformity Rule does not apply to the implementation of this action because NAS Jacksonville is located in a region that is in attainment for all NAAQS.

The proposed action is fully consistent with the enforceable policy because estimates of projected operational emissions show a decrease in annual emissions for all criteria pollutants under either of the alternatives. GHG emissions would also decrease.

CHAPTER 582 – SOIL AND WATER CONSERVATION

This statute provides for the control and prevention of soil erosion. It is the state's policy to preserve natural resources; control and prevent soil erosion, prevent floodwater and sediment damages and to further the conservation, development and use of soil and water resources, and the disposal of water. Land use policies are evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources on site or in adjoining properties affected by the project. Particular attention is given to projects on or near agricultural lands. Farm, forest, and grazing lands are among the basic assets of the state; and the preservation of these lands is necessary to protect and promote the health, safety, and general welfare of its people. These measures help to preserve state and private lands, control floods, maintain water quality, prevent impairment of dams and reservoirs, assist in maintaining the navigability of rivers and harbors, preserve wildlife and protect wildlife habitat, protect the tax base, protect public lands, and protect and promote the health, safety, and general welfare of the people of Florida. Statutory changes in 2012 expand the territory in which each water management district may conduct projects with other districts' approval.

Soils at the proposed construction site would be affected by the proposed action. Effects would occur from compaction and rutting from vehicle traffic and a potential for soil erosion during construction activities. The projected increase in new impervious area of approximately 10.88 acres under each alternative would increase the quantity and velocity of storm water runoff, which would increase the susceptibility of surrounding soils to erosion. Effects would be minimized or avoided by using standard soil erosion- and sedimentation-control techniques at the construction site such as silt barriers (filter fabric) and appropriate revegetation techniques upon completion. Revegetation techniques would include replanting disturbed areas with native plants and specific seed mixtures as recommended by the NRCS. Consequently, potential impacts on soils at NAS Jacksonville would not be significant. Under the No Action Alternative no additional facilities would be constructed to support the P-8A operations; therefore, topography and soils would not be affected.

The proposed action at NAS Jacksonville would not result in significant changes in topography and soils from construction activities. The projected increase in impervious surface of approximately 12.89 acres under each action alternative would represent a long-term loss of useable soils. Standard soil erosion and sedimentation-control techniques would be implemented to avoid and minimize erosion and sedimentation. Topography at NAS Jacksonville would not be affected by the proposed action alternatives because the site for new construction is generally level.

The proposed action is consistent to the maximum extent practicable with the enforceable policy.

Resources

Florida Department of Environmental Protection, Florida Coastal Management Program. March 2011. *Florida Coastal Management Program Guide – A Guide to the Federally Approved Florida Coastal Management Program*. 109 pp. http://www.dep.state.fl.us/cmp/publications/fcmp_guide_Feb_2012.pdf

Florida Department of Environmental Protection, Florida Coastal Management Program. March 2013. *Routine Program Change to State of Florida Coastal Management Program, Draft Request for Concurrence.* 19 pp. http://www.dep.state.fl.us/cmp/federal/fedconsv.htm

Florida Department of Environmental Protection. *24 Florida Statutes of the Florida Coastal Management Program.* Website accessed 04/30/2013. http://www.dep.state.fl.us/cmp/federal/24_statutes.htm

Florida Department of Environmental Protection. *Federal Consistency Intergovernmental Coordination and Review.* Website accessed 04/30/2013. http://www.dep.state.fl.us/cmp/federal/index.htm

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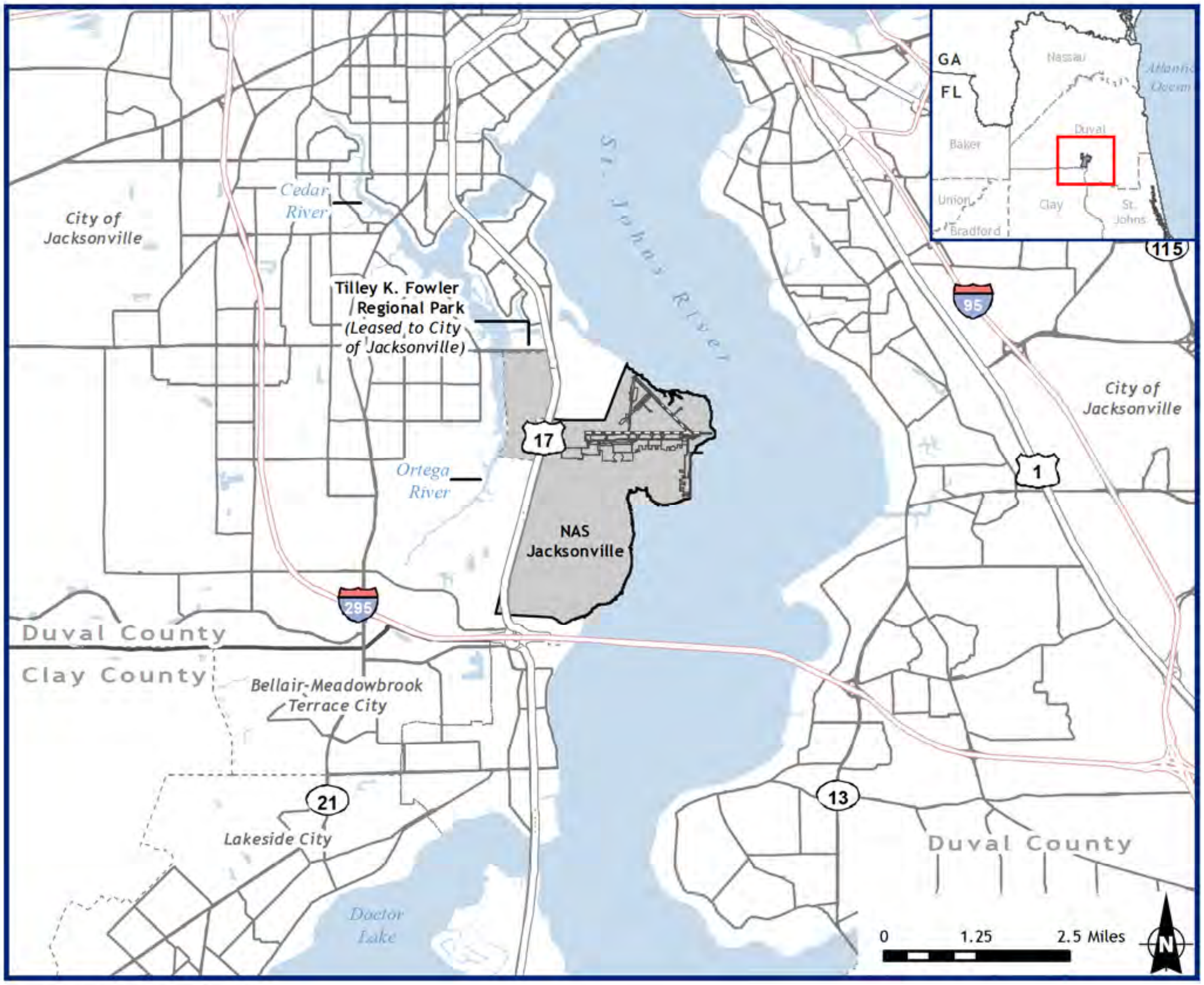
ATTACHMENT 1

GENERAL LOCATION MAP

NAS JACKSONVILLE
JACKSONVILLE, FLORIDA



Source: ESRI, 2012; UF Geoplan Center, 2007; NAS Jacksonville, 2012

Figure G-1
General Location Map - NAS Jacksonville
Jacksonville, Florida

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ATTACHMENT 2

PROPOSED CONSTRUCTION AREAS

NAS JACKSONVILLE
JACKSONVILLE, FLORIDA

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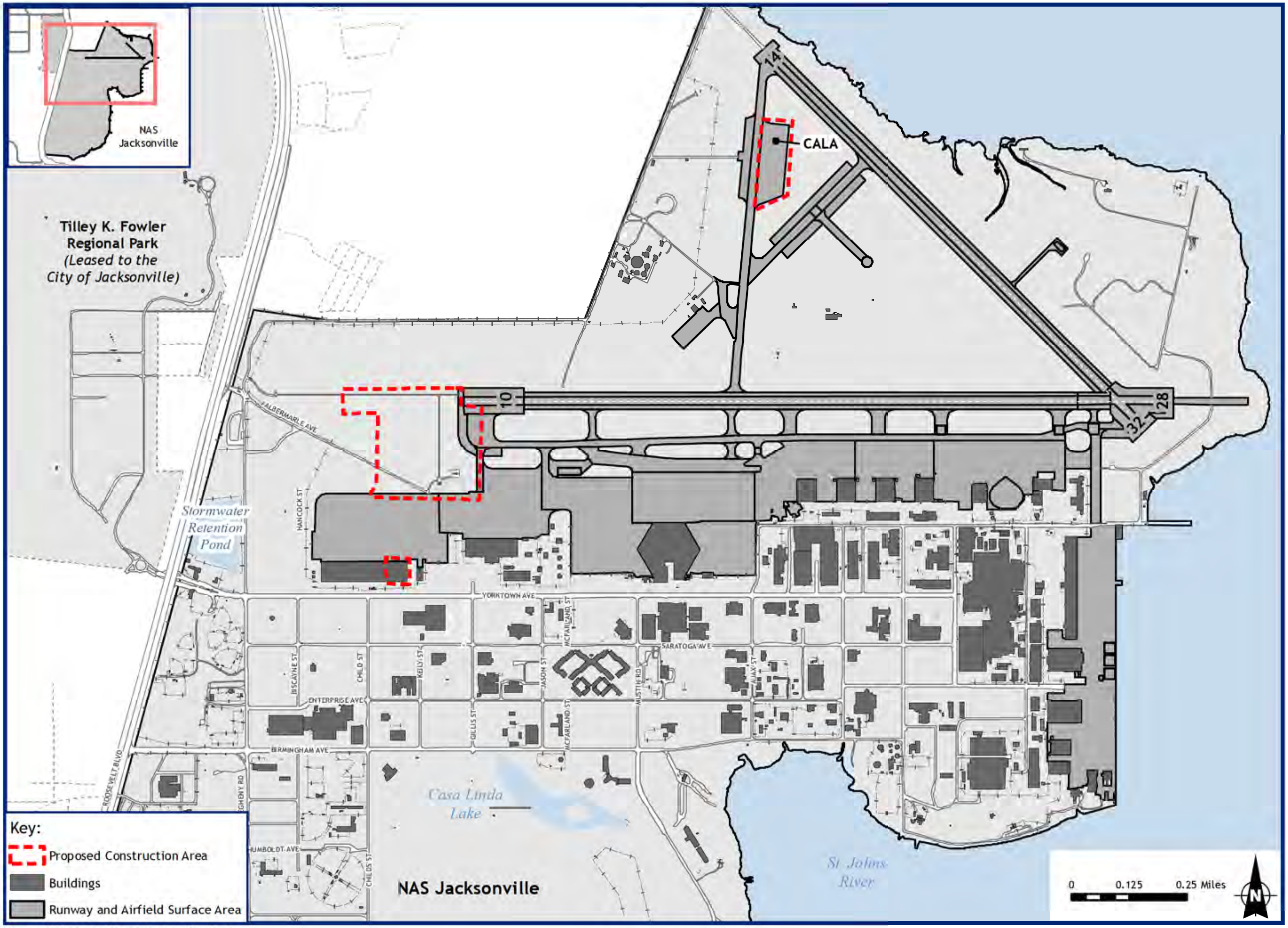

Source: ESRI, 2012; City of Jacksonville, 2007; NAS Jacksonville, 2012

Figure G-2
Proposed Construction Areas - NAS Jacksonville
Jacksonville, Florida

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ATTACHMENT 3

LAYOUT OF PLANNED FACILITIES
AT
NAS JACKSONVILLE
JACKSONVILLE, FLORIDA

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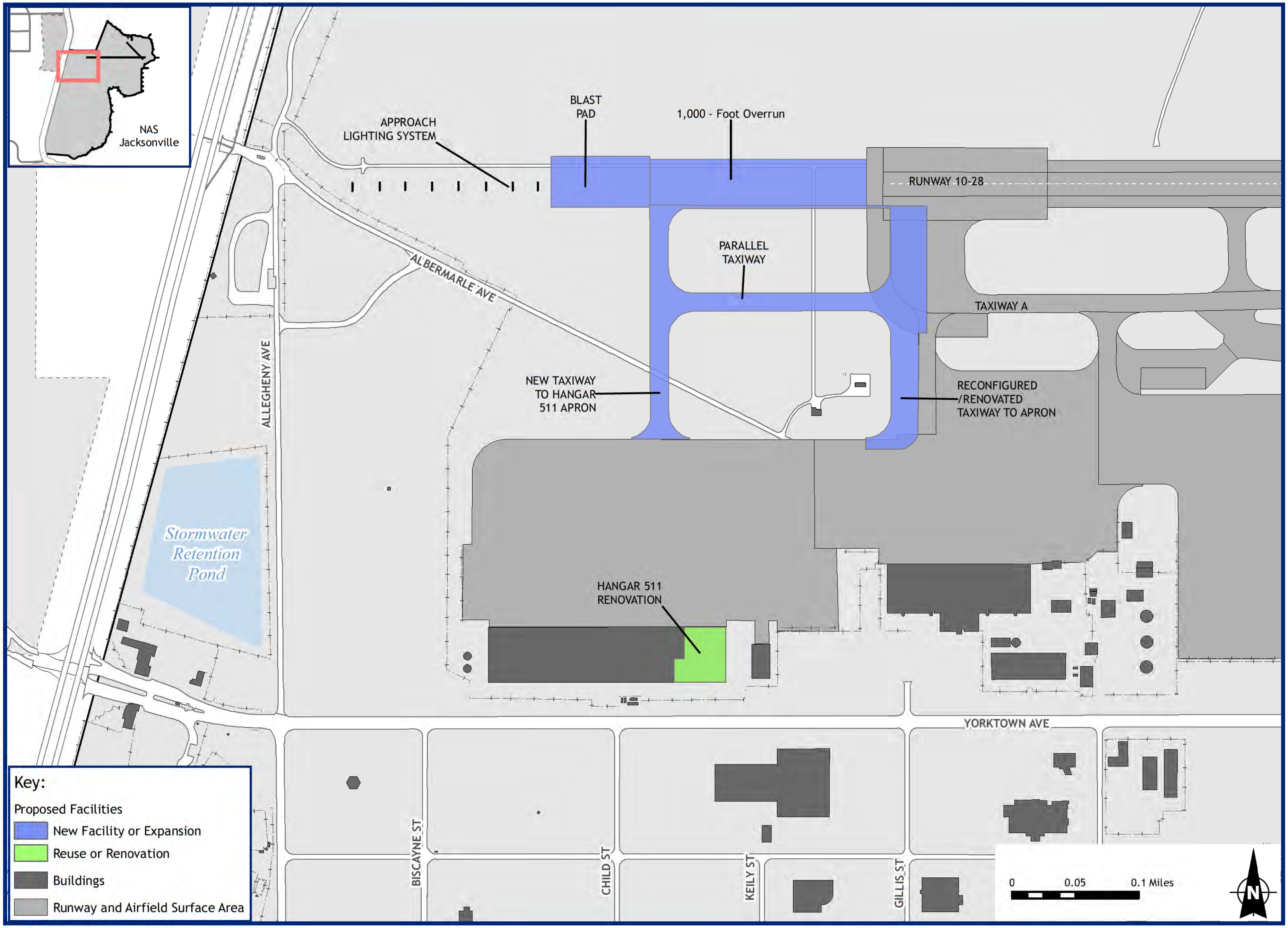


Source: ESRI, 2012; City of Jacksonville, 2007; NAS Jacksonville, 2012

Figure G-3
Layout of Planned Facilities at NAS Jacksonville
Jacksonville, Florida

APPENDIX G
COASTAL CONSISTENCY DETERMINATION FOR HOME BASING OF THE P-8A MULTI-MISSION MARITIME AIRCRAFT

NAS WHIDBEY ISLAND, WASHINGTON

Introduction

This document provides the State of Washington with the U.S. Department of the Navy's (Navy) Consistency Determination under Section 307 (c) (1) of the federal Coastal Zone Management Act (CZMA) of 1972, as amended, for the proposed home basing of the P-8A Multi-Mission Maritime Aircraft at Naval Air Station (NAS) Whidbey Island.

After careful consideration of the information, data, and analysis provided in the draft SEIS, the Navy has determined that the proposed action (regardless of the alternative chosen) will be undertaken in a manner consistent to the maximum extent practicable with the applicable objectives and the enforceable policies of Washington's Coastal Resources Management Program.

Proposed Federal Agency Action

The Navy needs to home base 12 P-8A squadrons and the FRS and has determined that home basing P-8A squadrons at two locations (rather than three) could provide potential cost savings while still meeting current strategic operational objectives. The SEIS considers home basing P-8A fleet squadrons and the FRS at two locations in order to meet the current requirements of the Navy, maximize the efficiency of support facilities and simulation devices, and optimize the number of personnel required.

The Navy is currently considering two potential alternatives that would home base up to seven fleet squadrons (49 aircraft) at NAS Whidbey Island. The following is a summary of the aircraft and personnel replacements that are proposed under either alternative.

Alternative 1. Alternative 1 considers the environmental effects of home basing P-8A squadrons at two locations: six fleet squadrons and the FRS at NAS Jacksonville and six fleet squadrons at NAS Whidbey Island. Alternative 1 considers a permanent, rotating squadron detachment at MCB Hawaii Kaneohe Bay and periodic squadron detachments at NB Coronado.

Alternative 2. Alternative 2 considers the environmental effects of home basing P-8A squadrons at two locations: five fleet squadrons and the FRS at NAS Jacksonville and seven fleet squadrons at NAS Whidbey Island. Alternative 2 considers a permanent, rotating squadron detachment at MCB Hawaii Kaneohe Bay and periodic squadron detachments at NB Coronado.

No Action Alternative. The No Action Alternative represents current conditions in April 2014 to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 ROD were to occur. The No Action Alternative represents conditions at the time of a new home basing decision:

- At NAS Jacksonville, training facilities and hangars exist to support the P-8A transition. By April 2014, four of six squadrons will have transitioned from P-3C to P-8A aircraft, and the FRS will consist of a combination of P-3C and P-8A aircraft.

- At NAS Whidbey and MCB Hawaii Kaneohe Bay, facilities and functions exist to continue supporting P-3C operations as the P-8A transition has not begun at these locations.

The No Action Alternative does not meet the purpose of and need for the proposed action to provide facilities and functions to home base at two locations; however, the No Action Alternative is carried forward for analysis as it represents a baseline condition against which environmental consequences can be measured.

Previous Action

In 2008, the Navy issued a Record of Decision (ROD) to replace the aging P-3C aircraft with the P-8A at NAS Jacksonville, NAS Whidbey Island, and Marine Corps Base (MCB) Hawaii Kaneohe Bay. Due to current conditions and new information, the Navy is preparing a Supplemental Environmental Impact Statement (SEIS) to consider new alternatives for home basing the P-8A that were not analyzed in the 2008 EIS prepared under the National Environmental Policy Act (NEPA). The Navy is preparing an SEIS to include the proposed action of providing facilities and functions to home base the P-8A aircraft at two established maritime patrol home bases. In addition, the SEIS incorporates changes to circumstances at the home base locations, and the latest P-8A program information.

In the 2008 ROD, the Navy determined that five fleet squadrons and the Fleet Replacement Squadron (FRS) would be home based at NAS Jacksonville, four fleet squadrons would be home based at NAS Whidbey Island, and three fleet squadrons would be home based at MCB Hawaii Kaneohe Bay, with periodic squadron detachments for training at Naval Base (NB) Coronado (Alternative 5 in the 2008 FEIS). By April 2014, four of six squadrons at NAS Jacksonville will have transitioned from the P-3C to the P-8A, and the FRS will consist of a combination of P-3C and P-8A aircraft at NAS Jacksonville; no P-8A transitions or related facility improvements will have occurred at NAS Whidbey Island or MCB Hawaii Kaneohe Bay.

A CCD was prepared and appended to the DEIS and 2008 FEIS. The Navy concluded that the proposed action was consistent to the maximum extent practicable with the enforceable policies of Washington's Coastal Resources Management Program. The Washington State Department of Ecology reviewed the CCD and concurred that the proposed federal activities at NAS Whidbey Island were consistent as long as a Section 401 WQC could be obtained from the U.S. Army Corps of Engineers.

Overview of NAS Whidbey Island

Commissioned on September 21, 1942, NAS Whidbey Island is located 50 miles north of Seattle, Washington, next to the City of Oak Harbor in Island County (see Attachment 1). NAS Whidbey Island includes two separate bases, Ault Field and Seaplane Base, and employs more than 9,000 military and civilian personnel. All facilities necessary to support P-8A aircraft at NAS Whidbey Island would be located at Ault Field, and all P-8A operations at NAS Whidbey Island would originate from and return to Ault Field. The air station is home to 17 active-duty squadrons, two reserve squadrons, and numerous tenant commands. NAS Whidbey Island serves as the host for CPRW-10. NAS Whidbey Island is the home base for three fleet P-3C squadrons (VP-1, VP-40, and VP-46), one reserve squadron of P-3C aircraft (VP-69), and one EP-3 aircraft squadron (VQ-1). NAS Whidbey Island is also home to the VAQ community, which includes nine carrier air wing (CVW) VAQ fleet squadrons (EA-6B Prowler and EA-18G Growler aircraft), three Expeditionary VAQ squadrons, and the VAQ FRS, which support the CVW and expeditionary missions. The air station also supports a Navy Reserve C-9 squadron (VR-61) in addition to the station's MH-60 search-and-rescue helicopters.

Action Overview at NAS Whidbey Island

Alternatives 1 and 2 would require facility renovation and construction at NAS Whidbey Island (see Attachments 2 and 3). Both siting alternatives would require the following:

- Demolition of existing Building 126 (P-3C simulator facility) and construction of a new two-story P-8A trainer facility of 101,104 sq ft (Alternative 2)];
- Renovation and expansion of existing Building 2771 for the Tactical Operations Center (TOC);
- Construction of a Mobile Tactical Operations Center adjacent to Building 2771 of 28,894 sq ft (Alternative 2);

- Expansion of Hangar 6 and hangar bay modification to 20,059 sq ft (Alternative 2);
- Expansion of Hangar 9 (6,000 sq ft);
- Reuse and minor interior renovation to Hangar 7;
- Construction of a Sensitive Compartmented Information Facility adjacent to Hangar 7 (1,000 sq ft);
- Reuse of existing Buildings 2738 and 2740 adjacent to new trainer facility;
- Construction of a Ground Support Equipment Shop (3,500 sq ft) and Outdoor Storage Area (12,000 sq ft) adjacent to Hangar 6; and
- Reuse of Building 219.

Modifications to Hangar 6 involve cutting notches in the hangar structure above the centerline of the bay doors to allow ingress/egress of P-8A aircraft, and replacement of the existing hangar doors. In addition, the existing maintenance bays would be extended to provide required clearances between interior walls and aircraft.

Alternatives 1 and 2 would require expansion of the existing aircraft parking ramp and paving of additional area for aircraft parking. Approximately 400,000 sq ft would be required for Alternative 1 (six squadrons), while 660,000 sq ft would be required for Alternative 2 (seven squadrons). Expansion of the apron requires demolition of Buildings 2707, 2666, 2786, 2621A, and 2621. Expansion of the existing apron would also require relocation of the existing aircraft rinse facility and relocation of the existing liquid oxygen (LOX) and sonobuoy storage facilities.

Alternative 2 (seven squadrons) requires construction of a new P-8A hangar bay (83,087 sq ft) adjacent to Hangar 6 to house two additional P-8A aircraft. Construction of the new hangar would not be required under Alternative 1. The hangar would contain a high-bay space and crew and equipment space.

Alternatives 1 and 2 also require construction of new vehicle parking (8,810 sq ft) on the west side of Charles Porter Avenue to support the additional squadron personnel.

Permitting and Environmental Impact Statement

Prior to implementation of the proposed action, all appropriate permits and authorizations will be obtained. These include a National Pollutant Discharge Elimination System (NPDES) Storm Water Construction General Permit from the Washington State Department of Ecology (Department of Ecology); a Section 404 Clean Water Act permit from the U.S. Army Corps of Engineers; a Section 401 Water Quality Certification from the Department of Ecology; and a Section 10 cultural resources authorization from the Washington Department of Archaeology and Historic Preservation.

The Navy published a draft SEIS for the proposed action in September 2013. The Coastal Consistency Determination is an appendix to the draft SEIS.

Background

The CZMA, enacted in 1972, created the National Coastal Management Program for management and control of the uses of and impacts on coastal zone resources. The program is implemented through federally approved state coastal management programs (CMPs).

Federal approval of a state CMP triggers the CZMA Section 307 federal consistency determination requirement. Section 307 mandates that federal actions within a state's coastal zone (or outside the coastal zone if the action affects land or water uses or natural resources within the coastal zone) be consistent to the maximum extent practicable with the enforceable policies of the state CMP. A federal agency considering actions that may impact waters governed by the CZMA uses these requirements to ensure compliance with the state's federally approved coastal management program. Federal agency actions include direct and indirect federal agency activities, federal approval activities, and federal financial assistance activities. Accordingly, federal agency activities (direct, indirect, or cumulative) reasonably affecting the state's coastal zone must be fully consistent with the enforceable policies of the state's CMP, unless compliance is otherwise prohibited by law. There are no categorical exemptions or exclusions to or from the Section 307 federal consistency requirement.

The first step is the CZMA federal consistency process is to determine whether the proposed action will have a "reasonably foreseeable direct, indirect, or cumulative effect on a state's coastal uses or resources" (U.S. Department of the Navy n.d.). This is called an "effects test." After conducting an effects test, the Navy determined the proposed action may result in reasonably foreseeable direct, indirect, or cumulative effects on Washington's coastal uses or resources; therefore, the Navy has prepared a coastal consistency determination.

The State of Washington has developed and implemented a federally approved CMP describing current coastal legislation and enforceable policies. Under the program, this determination of consistency is based on an evaluation of the policies of the Washington State Coastal Zone Management Program. Federal activities that may affect land use, water use, or natural resources in the coastal zone in Washington State are subject to consistency with the policies as described below, including:

- Shoreline Management Act (SMA);
- Water Pollution Control Act;
- Clean Air Washington Act;
- State Environmental Policy Act (SEPA);
- Energy Facility Site Evaluation Council (EFSEC); and
- Ocean Resource Management Act (ORMA).

Enforceable Policies Not Applicable to the Proposed Action

The Navy reviewed the Washington State CMP to identify enforceable policies relevant to the proposed action, approved as part of the coastal program, and enforceable on the Navy's proposed action. The Washington State CMP policies that are not applicable to the proposed action are identified and discussed in Table 1.

Table 1. Enforceable Polices of the Washington Coastal Management Program Not Applicable to the Proposed Action

Enforceable Policy	Explanation of Non-Applicability
State Environmental Policy Act Chapter 43.21 Revised Code of Washington (RCW)	Proposed action will be consistent with the National Environmental Policy Act and state and local agencies will be provided an opportunity to review and comment on the environmental impacts; therefore, a separate Washington SEPA review is not required.
Washington State Energy Facility Site Evaluation Council, Chapter 80.50 RCW	Proposed action would not include the addition of any new energy facilities.

Table 1. Enforceable Polices of the Washington Coastal Management Program Not Applicable to the Proposed Action

Enforceable Policy	Explanation of Non-Applicability
Ocean Resource Management Act, Chapter 43.143 RCW	Proposed action is not located in a coastal county under the ORMA, and the proposed action does not include any activities that could potentially interfere with or adversely impact renewable resources within Pacific Ocean coastal waters of Washington.

Enforceable Policies Applicable to the Proposed Action

The proposed action is analyzed for consistency with applicable CMP objectives below.

SHORELINE MANAGEMENT ACT, CHAPTER 90.58 RCW

The SMA designates preferred uses for protected shorelines and provides for the protection of shoreline natural resources and public access to shoreline areas. Under the SMA, protected shorelines include the following: (1) all marine waters; (2) streams and rivers with greater than 20 cubic feet per second mean annual flow; (3) lakes larger than 20 acres; (4) upland areas called shorelands that extend 200 feet landward from the edge of these waters; and (5) biological wetlands and river deltas and some or all of the 100-year floodplain, including all wetlands within the 100-year floodplain when they are associated with the prior four areas. The SMA also designates "shorelines of statewide significance," which are divided into marine areas, streams and rivers, and lakes. Within the "marine areas" category there are three delineations: (1) "the Pacific Ocean coastline," (2) "specific estuarine areas between the ordinary high water mark and line of extreme low tide and all associated shorelands," and (3) "all other areas of Puget Sound and the Strait of Juan de Fuca and adjacent salt water areas lying waterward of the line of extreme low tide line."

The proposed action would occur on federal land within a shoreline county of Washington; however, no aspect of the proposed action will have a direct effect on any protected shoreline or any shoreline natural resources as defined by the SMA. In addition, the proposed action will not interfere with public access to any shoreline areas.

The proposed action would be fully consistent with the SMA.

WATER POLLUTION CONTROL ACT, CHAPTER 90.48 RCW

The Washington Water Pollution Control Act is aimed at retaining and securing high quality for all waters of the state. In doing so, the Water Pollution Control Act works cooperatively with the Federal Clean Water Act (CWA) to regulate discharges to the navigable waters of the United States, including wetlands within Washington State. The Water Pollution Control Act prohibits the discharge of any polluting matter into the waters of the state. As such, the Department of Ecology has the authority to issue NPDES storm water permits for potential construction discharges. Construction activities must also implement best management practices (BMPs) as appropriate for the activity.

Because more than 1 acre would be disturbed during construction, a construction NPDES storm water permit will be obtained from the Washington State Department of Ecology through their water quality permit program. Under the permit, the Navy (NAS Whidbey Island) would submit a site-specific Storm Water Management Plan (SWMP) for new discharges that will include a site plan for managing storm water runoff and describe the BMPs to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollution. With proper implementation of the SWMP, impacts on water quality from erosion and off-site sedimentation during construction would be minor.

No wetlands would be disturbed by any of the construction projects proposed under Alternative 1. Construction associated with Alternative 2 would result in the loss of 1.64 acres of emergent wetland. Wetlands removed as a result of this alternative would be replaced as determined appropriate by the Department of Ecology and the U.S. Army Corps of Engineers through Section 401 and 404 permitting processes.. For the proposed action, the Navy will obtain a project-specific NPDES permit from the Department of Ecology, a project-specific SWMP will be implemented, and any wetlands disturbed under Alternative 2 will be mitigated in accordance with permit requirements.

The proposed action would be consistent to the maximum extent practicable with the Water Pollution Control Act.

WASHINGTON CLEAN AIR ACT, CHAPTER 70.94 RCW

The Washington Clean Air Act, as amended, provides for protection and enhancement of the state's air resources. The proposed action would be located in Island County. Air quality within Island County is regulated by the Northwest Clean Air Agency (NWCAA). The NWCAA is one of seven regional air quality control agencies that were formed after passage of the Clean Air Washington Act in 1967. The NWCAA requires a Notice of Construction and/or Prevention of Significant Deterioration (PSD) permit for applicable new sources within their region. Washington's air quality regulations have been derived from the Federal Clean Air Act (CAA). The CAA designates six pollutants as "criteria pollutants" for which National Ambient Air Quality Standards (NAAQS) have been established to protect public health and welfare. These include particulate matter less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead (Pb), and ozone (O_3). Areas that do not meet NAAQS for criteria pollutants are designated as "nonattainment areas" for that pollutant. Areas that achieve the air quality standard after being designated nonattainment areas are redesignated as "attainment areas" following U.S. Environmental Protection Agency approval of a maintenance plan.

The proposed action would not result in any permanent new sources of air pollutant emissions; therefore, a permit for a new source would not be required. NAS Whidbey Island is located in a region that is in attainment for all NAAQS; therefore, a conformity determination outlined in Section 176 (c) of the federal CAA would not be required. Temporary construction emissions would be generated and projected operational emissions would decrease in annual emissions for all criteria pollutants under both all alternatives, except for a slight increase in emissions of NO_X under Alternative 2.

The proposed action would be consistent to the maximum extent practicable with the Washington Clean Air Act.

Conclusion

After careful consideration of the information, data, and analysis provided in the draft SEIS, we have determined that the proposed action (regardless of the alternative chosen) will be undertaken in a manner consistent to the maximum extent practicable with the applicable objectives and the enforceable policies of Washington's Coastal Resources Management Program.

References

U.S. Department of the Navy. n.d. OPNAV (N45) Fact Sheet, Coastal Zone Management Federal Consistency Process, Accessed on May 7, 2013 at: www.envlibrary.ene.com

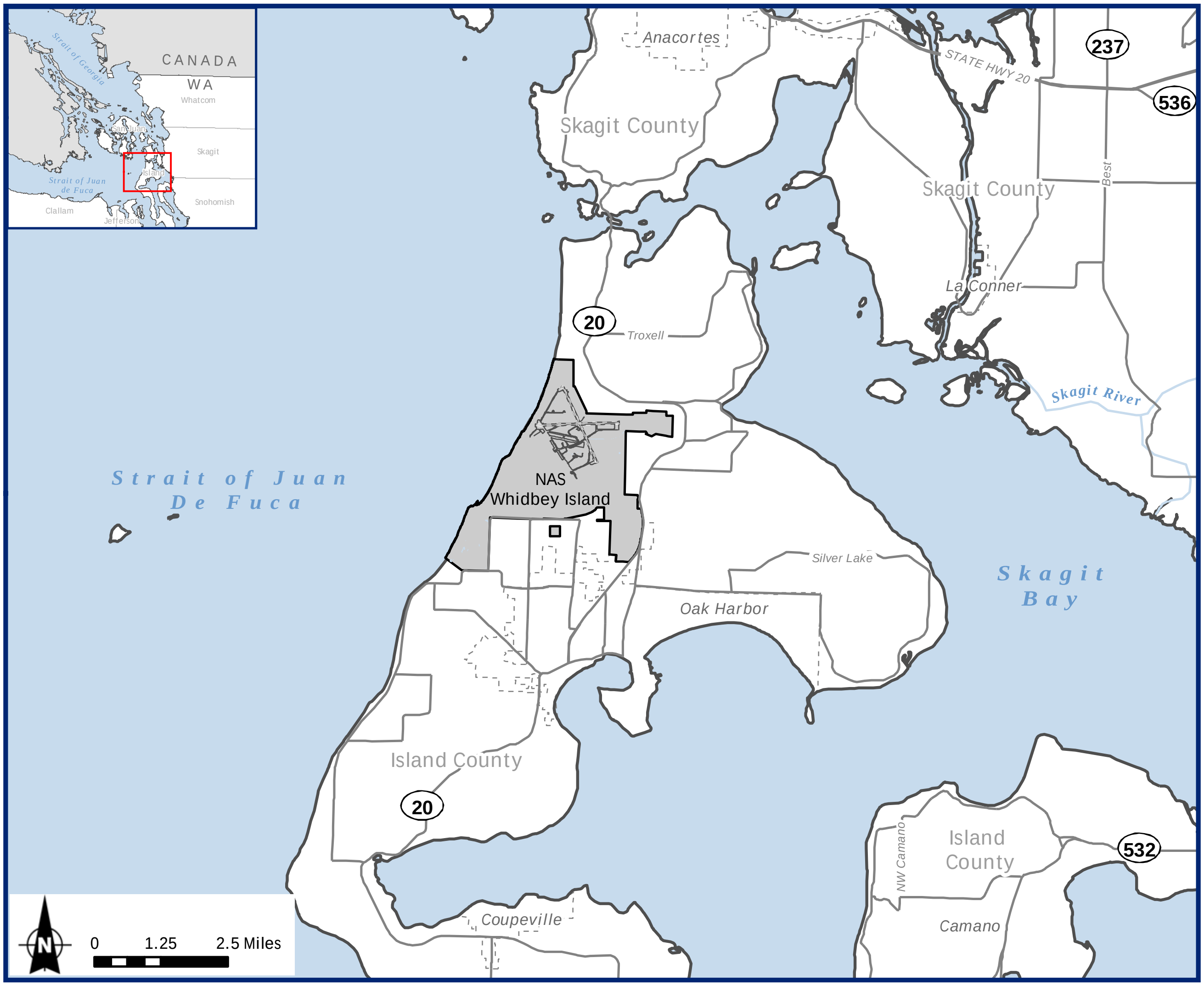
Washington Department of Ecology. 2012a. Washington State's Water Quality Assessment [303(d)] list for 2012. Accessed at http://www.ecy.wa.gov/programs/wq/303d/index.html.

__________. 2012b. Water Quality – Current EPA-Approved Assessment. As of December 21, 2012. Accessed on January 7, 2013, at: http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html

ATTACHMENT 1

GENERAL LOCATION MAP

NAS WHIDBEY ISLAND
ISLAND COUNTY, WASHINGTON



Source: ESRI, 2012; NAVFAC GeoRediness Center, 2006; NAS Whidbey Island, 2013.

Figure G-4
General Location Map - NAS Whidbey Island
Whidbey Island, Washington

ATTACHMENT 2

PROPOSED CONSTRUCTION AREA

NAS WHIDBEY ISLAND
ISLAND COUNTY, WASHINGTON

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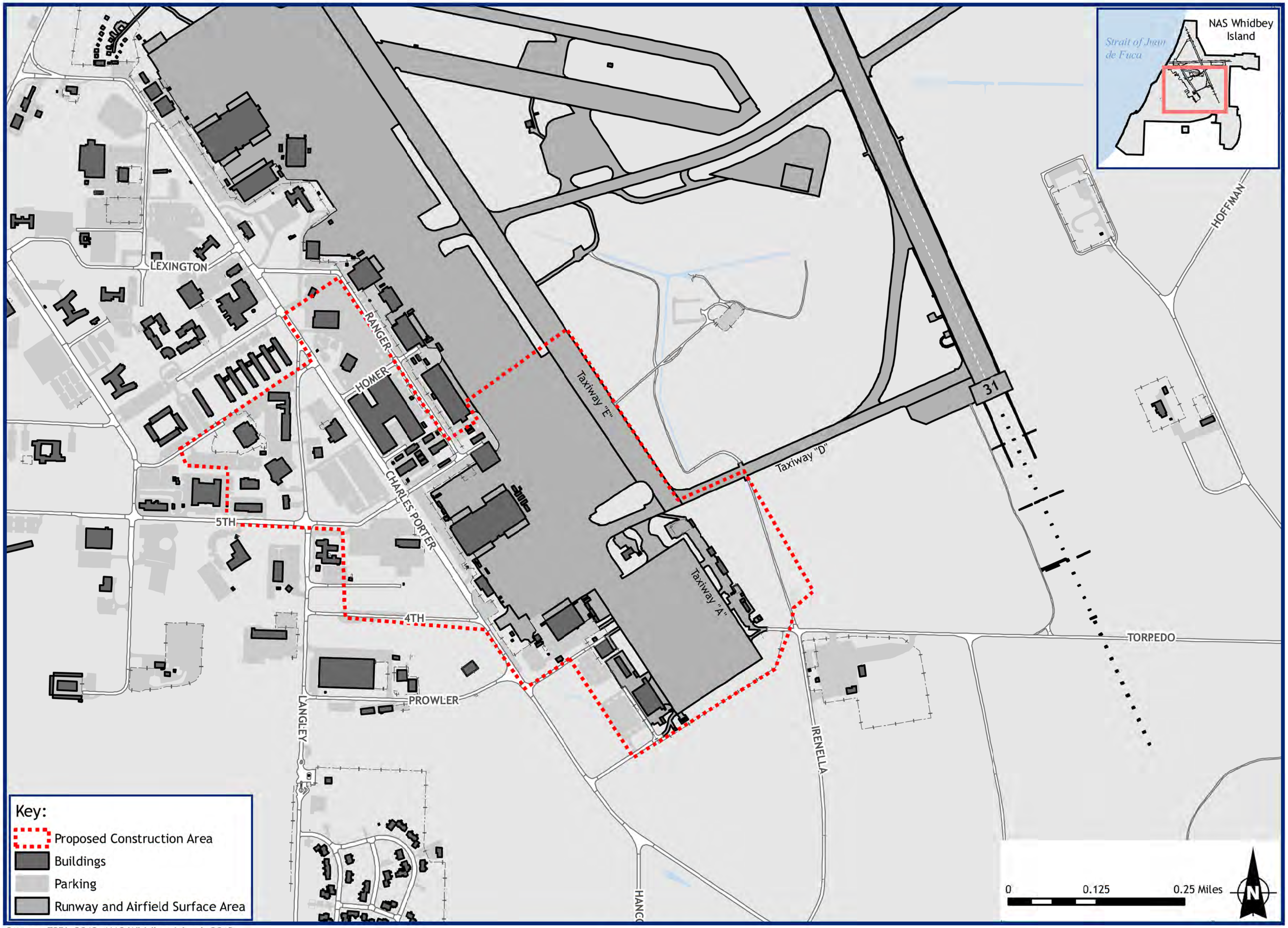

Source: ESRI, 2012; NAS Whidbey Island, 2013

Figure G-5
Proposed Construction Area - NAS Whidbey Island
Whidbey Island, Washington

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ATTACHMENT 3

LAYOUT OF PLANNED FACILITES PER ALTERNATIVE
AT
NAS WHIDBEY ISLAND
ISLAND COUNTY, WASHINGTON

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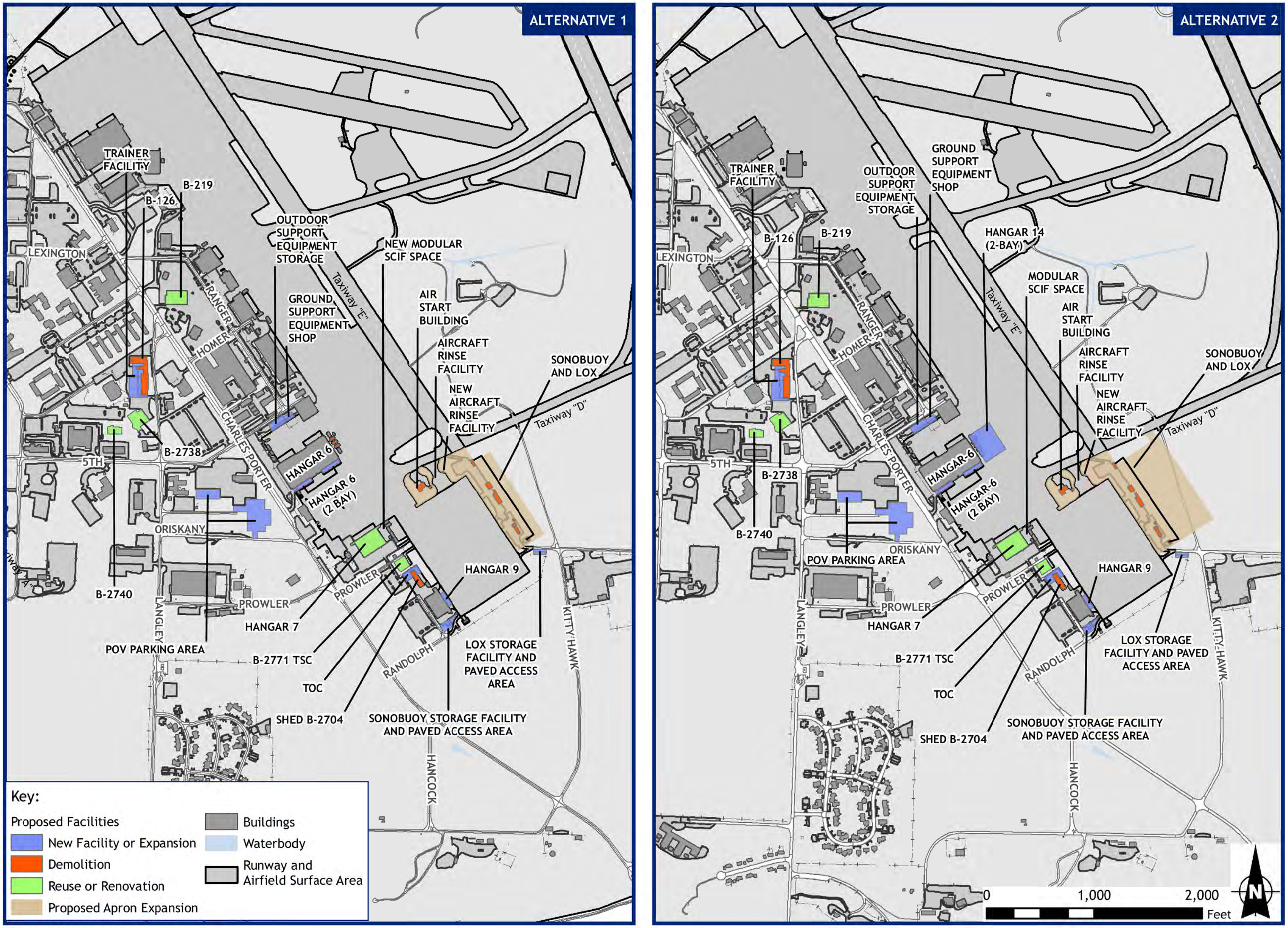


Source: ESRI, 2012; NAS Whidbey Island, 2013

Figure G-6
Layout of Planned Facilities per Alternative at
NAS Whidbey Island, Whidbey Island, Washington

APPENDIX G
COASTAL CONSISTENCY DETERMINATION FOR HOME BASING OF THE P-8A MULTI-MISSION MARITIME AIRCRAFT

MCB HAWAII KANEOHE BAY

Introduction

This document provides the State of Hawaii with the U.S. Department of the Navy's (Navy) Consistency Determination under Section 307 (c) (1) of the federal Coastal Zone Management Act (CZMA) of 1972, as amended, for the proposed home basing of the P-8A Multi-Mission Maritime Aircraft at Marine Corps Base (MCB) Hawaii Kaneohe Bay.

After careful consideration of the information, data, and analysis provided in the draft SEIS, the Navy has determined that the proposed action (regardless of the alternative chosen) will be undertaken in a manner consistent to the maximum extent practicable with the objectives and the applicable enforceable policies of Hawaii's Coastal Resources Management Program.

Proposed Federal Agency Action

The Navy needs to home base 12 P-8A squadrons and the FRS and has determined that home basing P-8A squadrons at two locations (rather than three) could provide potential cost savings while still meeting current strategic operational objectives. The SEIS considers home basing P-8A fleet squadrons and the FRS at two locations in order to meet the current requirements of the Navy, maximize the efficiency of support facilities and simulation devices, and optimize the number of personnel required.

The Navy is currently considering two potential alternatives that would home base three fleet squadrons (21 aircraft) or a permanent, rotating squadron detachment (two aircraft) at MCB Hawaii Kaneohe Bay. The following is a summary of the aircraft and personnel replacements that are proposed under either alternative.

Alternative 1. Alternative 1 considers the environmental effects of home basing P-8A squadrons at two locations: six fleet squadrons and the FRS at NAS Jacksonville and six fleet squadrons at NAS Whidbey Island. Alternative 1 considers a permanent, rotating squadron detachment at MCB Hawaii Kaneohe Bay and periodic squadron detachments at NB Coronado.

Alternative 2. Alternative 2 considers the environmental effects of home basing P-8A squadrons at two locations: five fleet squadrons and the FRS at NAS Jacksonville and seven fleet squadrons at NAS Whidbey Island. Alternative 2 considers a permanent, rotating squadron detachment at MCB Hawaii Kaneohe Bay and periodic squadron detachments at NB Coronado.

No Action Alternative. The No Action Alternative represents current conditions in April 2014 to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 ROD were to occur. The No Action Alternative represents conditions at the time of a new home basing decision:

- At NAS Jacksonville, training facilities and hangars exist to support the P-8A transition. By April 2014, four of six squadrons will have transitioned from P-3C to P-8A aircraft, and the FRS will consist of a combination of P-3C and P-8A aircraft.

- At NAS Whidbey and MCB Hawaii Kaneohe Bay, facilities and functions exist to continue supporting P-3C operations as the P-8A transition has not begun at these locations.

The No Action Alternative does not meet the purpose of and need for the proposed action to provide facilities and functions to home base at two locations; however, the No Action Alternative is carried forward for analysis as it represents a baseline condition against which environmental consequences can be measured.

Previous Action

In 2008, the Navy issued a Record of Decision (ROD) to replace the aging P-3C aircraft with the P-8A at Naval Air Station (NAS) Jacksonville, NAS Whidbey Island, and MCB Hawaii Kaneohe Bay. Due to current conditions and new information, the Navy is preparing a Supplemental Environmental Impact Statement (SEIS) to consider new alternatives for home basing the P-8A that were not analyzed in the 2008 EIS prepared under the National Environmental Policy Act. The Navy is preparing an SEIS to include the proposed action of providing facilities and functions to home base the P-8A aircraft at two established maritime patrol home bases. In addition, the SEIS incorporates changes to circumstances at the home base locations and the latest P-8A program information.

In the 2008 ROD, the Navy determined that five fleet squadrons and the Fleet Replacement Squadron (FRS) would be home based at NAS Jacksonville, four fleet squadrons would be home based at NAS Whidbey Island, and three fleet squadrons would be home based at MCB Hawaii Kaneohe Bay, with periodic squadron detachments for training at Naval Base (NB) Coronado (Alternative 5 in the 2008 Final Environmental Impact Statement (FEIS). By April 2014, four of six squadrons at NAS Jacksonville will have transitioned from the P-3C to the P-8A, and the FRS will consist of a combination of P-3C and P-8A aircraft at NAS Jacksonville; no P-8A transitions or related facility improvements will have occurred at NAS Whidbey Island or MCB Hawaii Kaneohe Bay.

A CCD was prepared and appended to the DEIS and 2008 FEIS. The Navy concluded that the proposed action was consistent to the maximum extent practicable with the enforceable polices of Hawaii’s Coastal Resources Management Program. The Hawaii Coastal Zone Management Program reviewed the CCD and concurred that the proposed federal activities at MCB Hawaii Kaneohe Bay were consistent with the state enforceable policies.

MCB Hawaii Kaneohe Bay Overview

MCB Hawaii Kaneohe Bay is located on the Mokapu Peninsula on the windward (east) side of Oahu, near the communities of Kaneohe and Kailua (see Attachment 1). The base is approximately 12 miles northeast of Honolulu. MCB Hawaii Kaneohe Bay is one of several USMC properties managed by MCB Hawaii Kaneohe Bay on Oahu. The installation is home to the Third Marine Regiment, Marine Aircraft Group 24, and the Third Radio Battalion. MCB Hawaii Kaneohe Bay serves as the host for the CPRW-2, which provides expeditionary patrol and reconnaissance forces in support of the Third, Fifth, and Seventh fleet operations. MCB Hawaii Kaneohe Bay hosts three fleet squadrons of P-3C aircraft (VP-4, VP-9, and VP-47), one Special Projects Patrol P-3C unit (VPU-2), one reserve logistics squadron (VR-51), one squadron of H-60 helicopters (HSL-37), one squadron of CH-53 helicopters (HMH-463), and a squadron of AH-1 and UH-1 helicopters (HMLA-367).

Action Overview at MCB Hawaii Kaneohe Bay

No new structures would be required to accommodate a permanent detachment under Alternatives 1 and 2. Modification of the interiors of the existing TOC (Building 6470) and Hangar 104 would accommodate P-8A detachment aircrews. Existing taxiway and shoulder at the aircraft parking apron would be expanded to accommodate a taxiway for the P-8A. The existing aircraft rinse facility would be expanded to accommodate the larger P-8A airframe. See Attachments 2 and 3 for an overview of the proposed facilities.

Permitting and Environmental Impact Statement

Prior to implementation of the proposed action, all appropriate permits and authorizations will be obtained. These may include a National Pollutant Discharge Elimination System (NPDES) Storm Water

Construction General Permit from the Hawaii State Department of Health and a Section 10 cultural resources authorization from the Hawaii Historic Preservation Division.

The Navy published a draft SEIS for the proposed action in September 2013. The Coastal Consistency Determination is appended to the draft SEIS.

Background

The CZMA, enacted in 1972, created the National Coastal Management Program for management and control of the uses of and effects on coastal zone resources. The program is implemented through federally approved state coastal management programs (CMPs).

Federal approval of a state CMP triggers the CZMA Section 307 federal consistency determination requirement. Section 307 mandates that federal actions within a state's coastal zone (or outside the coastal zone, if the action affects land or water uses or natural resources within the coastal zone) be consistent to the maximum extent practicable with the enforceable policies of the state CMP. A federal agency considering actions that may affect waters governed by the CZMA uses these requirements to ensure compliance with the state's federally approved coastal management program. Federal agency actions include direct and indirect federal agency activities, federal approval activities, and federal financial assistance activities. Accordingly, federal agency activities (direct, indirect, or cumulative) reasonably affecting the state's coastal zone must be fully consistent with the enforceable policies of the state's CMP, unless compliance is otherwise prohibited by law. There are no categorical exemptions or exclusions to or from the Section 307 federal consistency requirement.

The first step is the CZMA federal consistency process is to determine whether the proposed action will have a "reasonably foreseeable direct, indirect, or cumulative effect on a state's coastal uses or resources" (U.S. Department of the Navy n.d.). This is called an "effects test." After conducting an effects test, the Navy determined the proposed action may result in reasonably foreseeable direct, indirect, or cumulative effects on Hawaii's coastal uses or resources; therefore, the Navy has prepared a coastal consistency determination.

The State of Hawaii has developed and implemented a federally approved CMP describing current coastal legislation and enforceable policies. Under the program, activities that affect any land use, water use, or natural resource of the coastal zone must comply with the following ten enforceable policies: Recreational Resources, Historic Resources, Scenic and Open Space Resources, Coastal Ecosystems, Economic Uses, Coastal Hazards, Managing Development, Public Participation, Beach Protection, and Marine Resources.

Program and Policy Analysis

The Hawaii Coastal Zone Management Program (CZMP) consists of a series of objectives and policies that are outlined in the Hawaii Revised Statutes, Chapter 205A. These objectives and policies make up the Federal Consistency Assessment Form and include recreational resources, historic resources, scenic and open spaces, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources. These policies have been analyzed and are provided in Attachment 3.

A new portion of the CZMP (http://planning.hawaii.gov/czm/federal-consistency_2013) requires additional data and information for consistency reviews of activities requiring a federal license or permit associated with the proposed action. These are considered the enforceable policies of the CZMP and their applicability to the proposed action is analyzed below.

Hawaii Coastal Zone Management Enforceable Policies Not Applicable to the Proposed Action

The Navy reviewed the Hawaii CZMP to identify enforceable policies relevant to the proposed action, approved as part of the coastal program, and enforceable on the Navy's proposed action. The Hawaii CZMP policies that are not applicable to the proposed action are identified and discussed in Table 1.

Table 1 Enforceable Polices of the Hawaii Coastal Management Program Not Applicable to the Proposed Action

Enforceable Policy	Explanation of Non-Applicability
Shoreline Setback Variance	Proposed action activities would be more than 40 feet inland from the certified shoreline.
Conservation District Use Permit	Proposed action would not occur on the portion of the base within a conservation district, and the proposed action is located on a portion of the base designated as urban land use.
Stream and Channel Alteration Permit	Proposed action does not interact with any stream, stream channels, or any other surface waters.
Ocean Recreation-Commercial Use Permit	Proposed action does not involve the use of commercial vessels.
Ocean Recreation-Day Use Mooring Permit	Proposed action does not require day use moorings.
Section 401 Water Quality Certification	Proposed action does not require a Section 404 permit; therefore, a Section 401 Water Quality Certification is not required.

Hawaii Coastal Zone Management Program Applicable Enforceable Policies

The proposed action is analyzed for consistency with applicable CMP objectives below.

Special Management Area Permit

As part of the CZMP, the Special Management Area (SMA) permit regulates permissible land uses that are already allowed by land use policies, including zoning designations, county general plans, and community development plans. The SMA permit is governed by the Hawaii Revised Statutes (HRS) Chapter 205A Coastal Zone Management, Part II Special Management Areas, and Hawaii Administrative Rules (HAR) Chapter 15-150 Rules Governing Special Management Areas and Shoreline Areas within Community Development Districts and Procedures Before the Office of Planning. This statute designates the various county planning commissions as the authority in charge of the SMA program. Within the City and County of Honolulu, the SMA program is governed under the Revised Ordinance of Honolulu, Chapter 25. A permit is required for development within an SMA. Development must not have any substantial, adverse environmental or ecological effect except unless that adverse effect is minimized to the extent practicable. SMA's have been established by the city council of the City and County of Honolulu. MCB Hawaii Kaneohe Bay is located within an SMA.

Development is defined as:

(1) The placement or erection of any solid material or any gaseous, liquid, solid, or thermal waste;

(2) Grading, removing, dredging, mining, or extraction of any materials;

(3) Change in the density or intensity of use of land, including but not limited to the division or subdivision of land;

(4) Change in the intensity of use of water, ecology related thereto, or of access thereto; and

(5) Construction, reconstruction, demolition, or alteration of the size of any structure.

Both Alternatives 1 and 2 would require new construction adjacent to the existing taxiway and rinse facility. This would include disturbing (e.g., grading, removing, etc.) 1.67 acres of soils and vegetation (see Attachment 2). In addition, an existing aircraft hangar would be modified or "altered" (see Attachment 2). Based on this definition of development, the proposed action may require an SMA permit and filing an environmental assessment or impact statement. Section 15-150-12 of Hawaii Administrative

Rules (d) states that "any development which has been assessed under NEPA …and a required EIS has been accepted may be waived from the environmental assessment requirement in this chapter" (Hawaii Department of Business, Economic Development, and Tourism, Office of Planning 2009). In addition, Section 11-200-25 (D) of the Hawaii Administrative Rules states that "where federal law has EIS requirements in addition to but not in conflict with this chapter, the office and agencies shall cooperate in fulfilling the requirements so that one document shall comply with all applicable laws" (Hawaii Administrative Rules, April 2008).

With the preparation of a NEPA EIS and findings that the proposed action would not have a substantial adverse environmental or ecological effect, the Navy determined that the proposed action is consistent to the maximum extent practicable with this policy.

National Pollutant Discharge Elimination System Permit

As part of the CZMP, an NPDES permit is required "before discharging any pollutant, or beginning construction activities that disturb one or more acres of land, or substantially altering the quality of any discharges, or substantially increasing the quantity of any discharges." Water pollution is governed by HRS Chapter 342D Water Pollution and HAR Chapter 11-55 Water Pollution Control. The HRS Chapter 342D Water Pollution statute designates Hawaii State Department of Health, Clean Water Branch as the authority in charge of conserving state waters and protecting, maintaining and improving the quality of state waters.

Under Alternatives 1 and 2 the Navy will obtain an individual NPDES permit for the discharge of storm water from construction activities as required from the State of Hawaii, Department of Health. Under the permit, the Navy would submit a site-specific Storm Water Pollution Control Plan (SWPPP) that would include a site plan for managing storm water runoff and the best management practices (BMPs) to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollutants. Under Alternatives 1 and 2, the addition of new impervious surfaces would generate additional storm water runoff. The addition of storm water runoff would require a revision of the base's current NPDES permit (Permit No. HI 0110078). Site-specific BMPs and other storm water management practices as specified in the base's existing Storm Water Management Plan would be applied when appropriate.

MCB Hawaii Kaneohe Bay would continue to comply with established BMPs and programs for the management of hazardous substances and spill response at the base. Potential oil or other material spills from the aircraft would be minimized by appropriate management techniques, such as requiring all equipment to be in good condition and properly maintained to avoid the potential for spills and other leaks.

The proposed action is consistent to the maximum extent practicable with the enforceable policy.

Conclusion

After careful consideration of the information, data, and analysis provided in the draft SEIS, we have determined that the proposed action (regardless of the alternative chosen) will be undertaken in a manner consistent to the maximum extent practicable with the objectives and the enforceable policies of Hawaii's Coastal Resources Management Program.

References

U.S. Department of the Navy. n.d. OPNAV (N45) Fact Sheet, Coastal Zone Management Federal Consistency Process, accessed on May 7, 2013 at: www.envlibrary.ene.com.

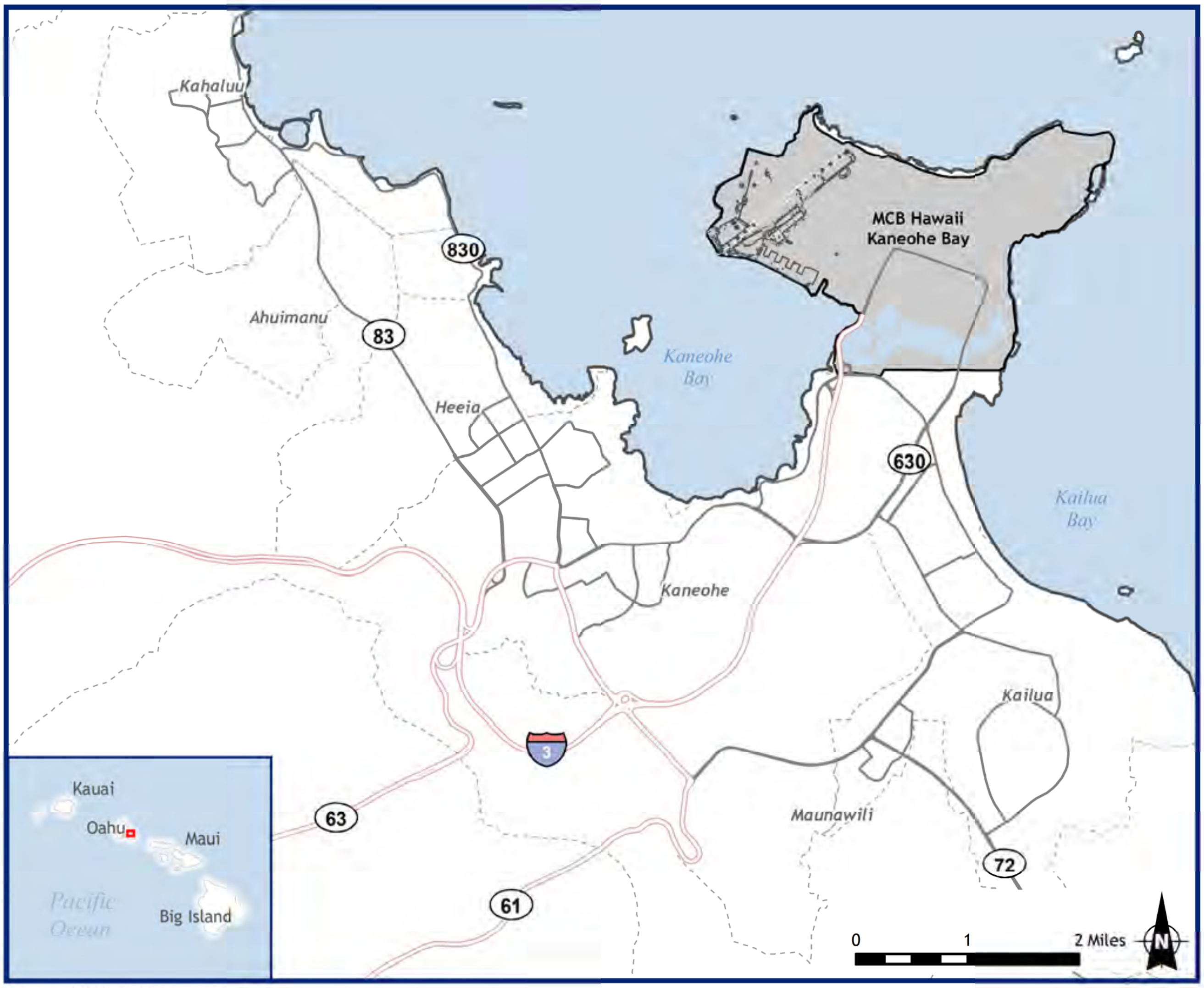
Hawaii Department of Business, Economic Development, and Tourism, Office of Planning, 2009, Appendix S-34 Special Management Area Use Permit, Updated November 2009.

Hawaii Administrate Rules, Title 11, Department of Health, Chapter 200 Environmental Impact Statement Rules, Updated April 2008, Unofficial copy.

ATTACHMENT 1

GENERAL LOCATION MAP

MCB HAWAII, KENEOHE BAY
OAHU, HAWAII



Source: ESRI,2012; MCBH Kaneohe Bay, 2007

Figure G-7
General Location Map - MCB Hawaii Kaneohe Bay
Oahu, Hawaii

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ATTACHMENT 2

PROPOSED CONSTRUCTION AREAS

MCB HAWAII, KENEOHE BAY
OAHU, HAWAII

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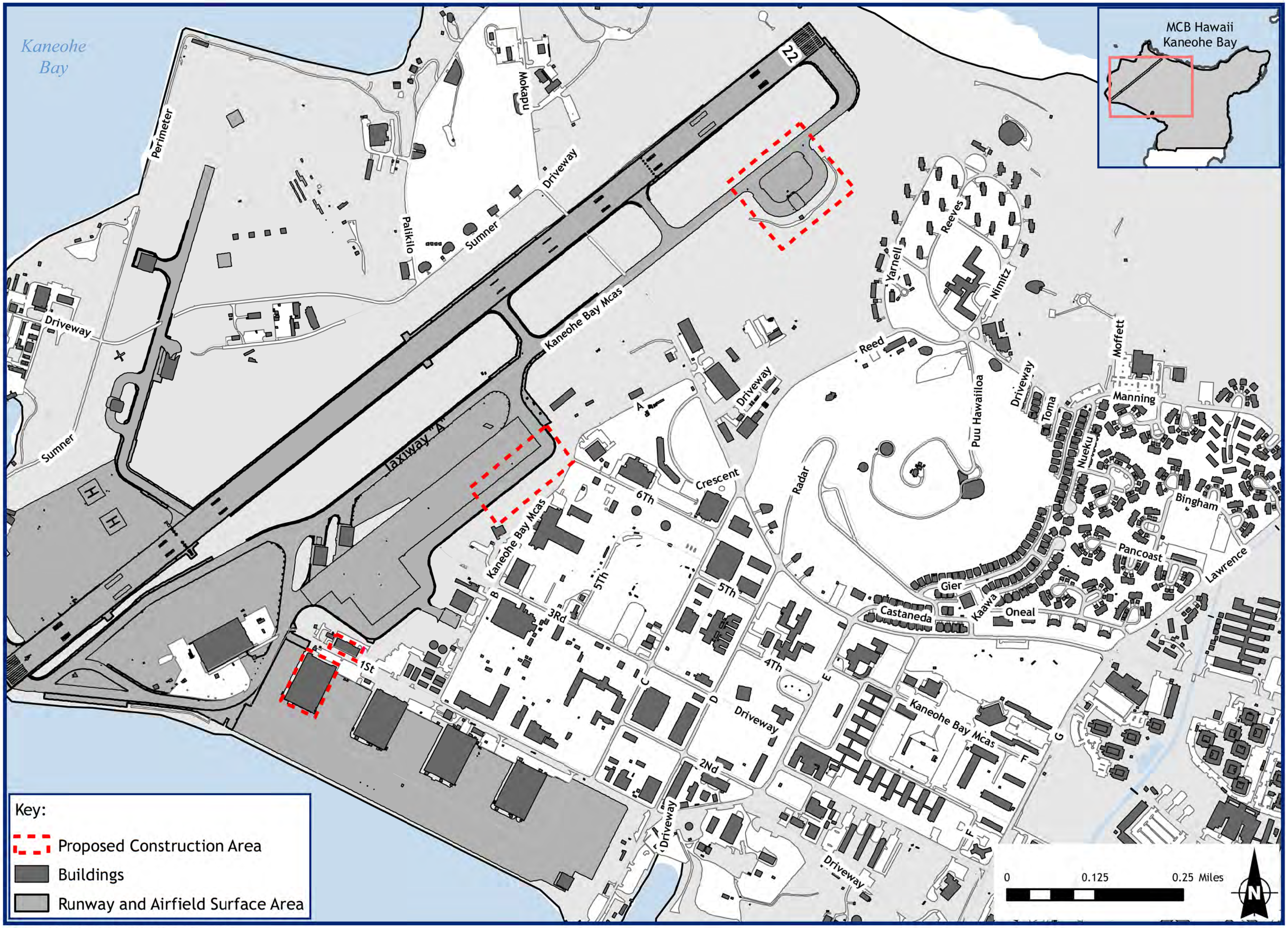

Source: ESRI, 2012; MCBH Kaneohe Bay, 2007.

Figure G-8
Proposed Construction Areas - MCB Hawaii Kaneohe Bay
Oahu, Hawaii

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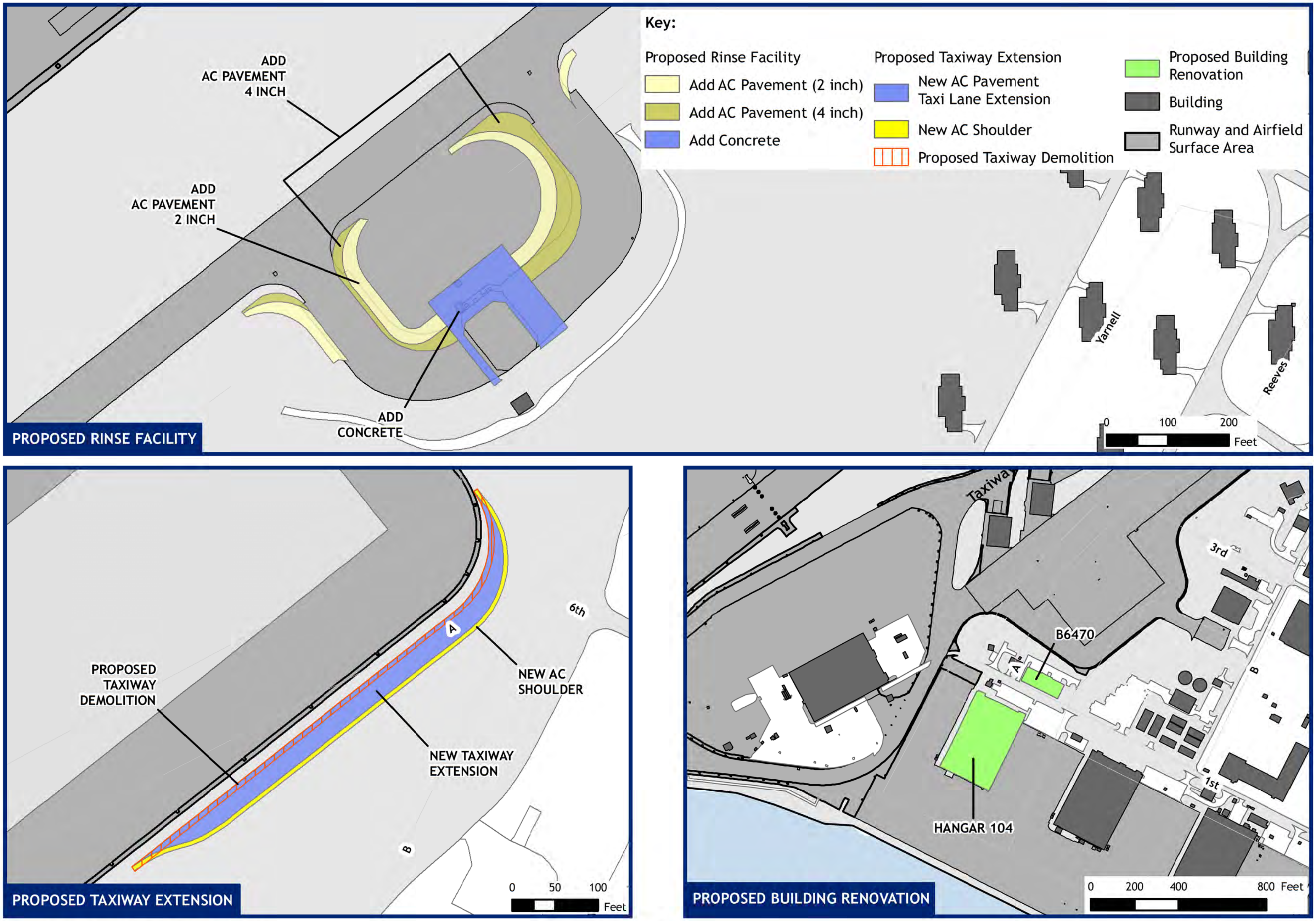
ATTACHMENT 3

LAYOUT OF PLANNED FACILITES
FOR
MCB HAWAII, KENEOHE BAY
OAHU, HAWAII



Source: ESRI, 2012; MCBH Kaneohe Bay, 2007; 2013.

Figure G-9
Layout of Planned Facilities for
MCB Hawaii Kaneohe Bay, Oahu, Hawaii

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ATTACHMENT 4

HAWAII CZM PROGRAM,
FEDERAL CONSISTENCY ASSESSMENT FORM

MCB HAWAII, KANEOHE BAY
OAHU, HAWAII

HAWAII CZM PROGRAM
FEDERAL CONSISTENCY ASSESSMENT FORM

RECREATIONAL RESOURCES

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

1) Improve coordination and funding of coastal recreation planning and management.

2) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

   a) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

   b) Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites and sandy beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;

   c) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

   d) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

   e) Encouraging expanded public recreational use of county, State, and Federally owned or controlled shoreline lands and waters having recreational value;

   f) Adopting water quality standards and regulating point and non-point sources of pollution to protect and where feasible, restore the recreational value of coastal waters;

   g) Developing new shoreline recreational opportunities, where appropriate, such as artificial reefs for surfing and fishing; and

   h) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, County planning commissions; and crediting such dedication against the requirements of section 46-6.

RECREATIONAL RESOURCES (continued)

Check either "Yes" or "No" for each of the following questions:		Yes	No
1.	Will the proposed action involve or be near a dedicated public right-of-way?	☐	☒
2.	Does the project site abut the shoreline?	☐	☒
3.	Is the project site near a State or County park?	☐	☒
4.	Is the project site near a perennial stream?	☐	☒
5.	Will the proposed action occur in or affect a surf site?	☐	☒
6.	Will the proposed action occur in or affect a popular fishing area?	☐	☒
7.	Will the proposed action occur in or affect a recreational or boating area?	☐	☒
8.	Is the project site near a sandy beach?	☐	☒
9.	Are there swimming or other recreational uses in the area?	☐	☒

Discussion:

New construction to support the proposed action would be located in a developed portion of MCB Hawaii Kaneohe Bay, more than 500 feet from the shoreline. No county, state, or federally owned recreational lands would be affected by the proposed action. Opportunities for recreation on shoreline parks and other recreational facilities would not be affected. The proposed action is fully consistent with the enforceable policy.

HISTORIC RESOURCES

Objective: Protect, preserve, and where desirable, restore those natural and man-made historic and pre-historic resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

1) Identify and analyze significant archaeological resources;
2) Maximize information retention through preservation of remains and artifacts or salvage operations; and
3) Support State goals for protection, restoration, interpretation, and display of historic resources.

Check either "Yes" or "No" for each of the following questions:	**Yes**	**No**
1. Is the project site within a historic/cultural district?	☐	☒
2. Is the project site listed on or nominated to the Hawaii or National register of historic places?	☐	☒
3. Does the project site include undeveloped land which has not been surveyed by an archaeologist?	☐	☒
4. Has a site survey revealed any information on historic or archaeological resources?	☐	☒
5. Is the project site within or near a Hawaiian fishpond or historic settlement area?	☒	☐

Discussion:

The proposed action is within the Naval Air Station Kaneohe Bay Aviation District, which is eligible for inclusion in the NRHP. The proposed action requires renovation of an NRHP-eligible historic property (an existing aircraft hangar). As part of the effects determination pursuant to Section 106 of the NHPA and implementing regulations for Section 106 at 36 CFR Part 800, the USMC will initiate consultation with the Hawaii SHPO regarding potential direct and indirect effects of proposed construction activities on the aircraft hangar and the Naval Air Station Kaneohe Bay Aviation District from the proposed renovations. The proposed action is consistent to the extent practicable with the enforceable policy.

SCENIC AND OPEN SPACE RESOURCES

Objective: Protect, preserve and where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

1) Identify valued scenic resources in the coastal zone management area;

2) Insure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

3) Preserve, maintain and where desirable, improve and restore shoreline open space and scenic resources; and

4) Encourage those developments that are not coastal dependent to locate in inland areas.

Check either "Yes" or "No" for each of the following questions:	**Yes**	**No**
1. Does the project site abut a scenic landmark?	☐	☒
2. Does the proposed action involve the construction of a multi-story structure or structures?	☐	☒
3. Is the project site adjacent to undeveloped parcels?	☒	☐
4. Does the proposed action involve the construction of structures visible between the nearest coastal roadway and the shoreline?	☐	☒
5. Will the proposed action involve construction in or on waters seaward of the shoreline? On or near a beach?	☐	☒

Discussion:

The proposed action would not affect existing public views to and along the shoreline, shoreline open space, and scenic resources. The proposed action is fully consistent with the enforceable policy.

COASTAL ECOSYSTEMS

Objective: Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

1) Improve the technical basis for natural resources management;
2) Preserve valuable coastal ecosystems of significant biological or economic importance;
3) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land water uses, recognizing competing water needs; and
4) Promote water quantity and quality planning and management practices, which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses, which violate State, water quality standards.

Check either "Yes" or "No" for each of the following questions:	Yes	No
1. Does the proposed action involve dredge or fill activities?	☐	☒
2. Is the project site within the Shoreline Setback Area (20 to 40 feet inland of the shoreline)?	☐	☒
3. Will the proposed action require some form of effluent discharge into a body of water?	☐	☒
4. Will the proposed action require earthwork beyond clearing and grubbing?	☐	☒
5. Will the proposed action include the construction of special waste treatment facilities, such as injection wells, discharge pipes, or cesspools?	☐	☒
6. Is an intermittent or perennial stream located on or near the project site?	☐	☒
7. Does the project site provide habitat for endangered species of plants, birds, or mammals?	☐	☒
8. Is any such habitat located nearby?	☐	☒
9. Is there a wetland on the project site?	☐	☒
10. Is the project site situated in or abutting a Natural Area Reserve?	☐	☒
11. Is the project site situated in or abutting a Marine Life Conservation District?	☐	☒
12. Is the project site situated in or abutting an estuary?	☐	☒

Discussion:

New construction to support the proposed action would be located farther than 500 feet from the nearest shoreline and would have no direct effect on wetlands, streams, or other coastal resources. The proposed action would result in a slight increase in storm water discharge into Kaneohe Bay from the addition of new impervious surface at the base. Best management practices will be implemented during and after construction to control the volume and quality of storm water effluent. Consequently, impacts on the marine environment would be minor and highly localized. The proposed action is consistent to the extent practicable with the enforceable policy.

ECONOMIC USES

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

1) Concentrate in appropriate areas the location of coastal dependent development necessary to the State's economy;

2) Insure that coastal dependent development such as harbors and ports, visitor industry facilities, and energy generating facilities are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and

3) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such development and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

   a) Utilization of presently designated locations is not feasible;

   b) Adverse environmental effects are minimized; and

   c) Important to the State's economy.

Check either "Yes" or "No" for each of the following questions:		**Yes**	**No**
1.	Does the project involve a harbor or port?	☐	☒
2.	Is the project site within a designated tourist destination area?	☐	☒
3.	Does the project site include agricultural lands or lands designated for such use?	☐	☒
4.	Does the proposed activity relate to commercial fishing or seafood production?	☐	☒
5.	Does the proposed activity related to energy production?	☐	☒
6.	Does the proposed activity relate to seabed mining?	☐	☒

Discussion:

All construction associated with the proposed action would occur on land within MCB Hawaii Kaneohe Bay. The proposed action is fully consistent with the enforceable policy.

COASTAL HAZARDS

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, and subsidence.

Policies:

1) Develop and communicate adequate information on storm wave, tsunami, flood erosion, and subsidence hazard;

2) Control development in areas subject to storm wave, tsunami, flood, erosion, and subsidence hazard;

3) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

4) Prevent coastal flooding from inland projects.

Check either "Yes" or "No" for each of the following questions:	**Yes**	**No**
1. Is the project site on or abutting a sandy beach?	☐	☒
2. Is the project site within a potential tsunami inundation area as depicted on the National Flood Insurance Program flood hazard map?	☐	☒
3. Is the project site within a potential flood inundation area according to a flood hazard map?	☐	☒
4. Is the project site within a potential subsidence hazard areas according to a subsidence hazard map?	☐	☒
5. Has the project site or nearby shoreline areas experienced shoreline erosion?	☐	☒

Discussion:

The proposed action would not include construction in areas subject to storm waves, tsunamis, flooding, erosion, and subsidence hazards, or significantly increase point and non-point source pollution. The proposed action is fully consistent with the enforceable policy.

MANAGING DEVELOPMENT

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

1) Effectively utilize and implement existing law to the maximum extent possible in managing present and future coastal zone development;

2) Facilitate timely processing of application for development permits and resolve overlapping or conflicting permit requirements; and

3) Communicate the potential short- and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the general public to facilitate public participation in the planning and review process.

Check either "Yes" or "No" for each of the following questions:		Yes	No
1.	Will the proposed activity require more than two (2) permits or approval? (Provide the status of each.)	☒	☐
2.	Does the proposed activity conform with the State and County land use designations for the site?	☒	☐
3.	Has or will the public be notified of the proposed activity?	☒	☐
4.	Has a draft or final environmental impact statement or an environmental assessment been prepared?	☒	☐

Discussion:

The proposed action is being reviewed under the National Environmental Policy Act (NEPA), which includes full disclosure of environmental impacts and provides opportunities for public review and comment. The Navy published a Notice of Intent (NOI) to announce the preparation of the SEIS on November 15, 2012, and forwarded courtesy notification and coordination letters to federal, state, and local government agencies, American Indian tribes, nongovernmental groups, and individuals most likely to be interested in the supplemental analysis. The Navy established a public website (www.mmaseis.com) to provide updated information on the project. The proposed action is fully consistent with the enforceable policy.

PUBLIC PARTICIPATION

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

1) Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management program;

2) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities; and

3) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion. Please provide information about the proposal relevant to the Objective and Policies No. 2 and No. 3 above:

The MCB Hawaii Kaneohe Bay Environmental Affairs Division regularly hosts environmental tours of unique and sensitive resources on the base and disseminates information on ecosystem management activities to the public. The proposed action is fully consistent with the enforceable policy.

BEACH PROTECTION

Objective: Protect beaches for public use and recreation.

Policies:

1) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;

2) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

3) Minimize the construction of public erosion-protection structures seaward of the shoreline.

Discussion. Please provide information about the proposal relevant to the Objective and Policies above:

The proposed action would not include shoreline development. This enforceable policy is not applicable to the proposed action.

MARINE RESOURCES

Objective: Implement the State's ocean resources management plan.

Policies:

1) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

2) Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

3) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;

4) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

5) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

6) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion. Please provide information about the proposal relevant to the Objective and Policies above:

The proposed action would not include the use or development of marine and coastal resources. This enforceable policy is not applicable to the proposed action.

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H NAS Whidbey Island Wetland Reports

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Wetland Delineation Report for
Naval Air Station Whidbey Island
Whidbey Island, Island County, Washington

DEPARTMENT OF THE NAVY

August 2013

Prepared By:
ecology and environment, inc.
720 3rd Ave, Suite 1700
Seattle, Washington 98104

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EXECUTIVE SUMMARY

As part of the analysis for the 2008 Final Environmental Impact Statement (EIS) for *Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet*, six homebasing alternatives were considered at Naval Air Station Whidbey Island (NAS Whidbey Island) Island County, Washington. Alternative 5 was considered to best meet the mission requirements of the Navy while optimizing operational efficiencies related to training and contractor logistics support functions. A notice of the Record of Decision (ROD) was published in the Federal Register (FR) on January 2, 2009 (74 FR 100).

As part of the Final EIS analysis, three wetland delineations were performed by ecologists from Ecology and Environment, Inc., (E & E) in 2007. The results of these delineations were documented in a wetland delineation report (E & E 2008) that was submitted to the U.S. Army Corp of Engineers (USACE) in February 2008 as part of a request for jurisdictional determination (JD). Subsequently, the Navy received a JD from the USACE on April 9, 2008, concurring with all three of the NAS Whidbey Island wetland delineations.

Since the ROD was published, the Navy has determined that homebasing P-8A squadrons at two rather than three locations could provide potential cost savings while still meeting current strategic operational objectives. As such, the Navy is now preparing a Supplemental EIS to evaluate changes to the homebasing alternatives and analysis contained in the 2008 Final EIS. The Supplemental EIS will assess the potential effects of homebasing P-8A aircraft, the related changes in aircraft operations and personnel, and facility modifications and construction requirements.

The purpose of this report is to discuss the findings from performing a jurisdictional delineation within a 16-acre study area at NAS Whidbey Island. The area was previously surveyed in 2007 for the Final EIS (E & E 2008). E & E conducted a delineation of the area on February 1, 2013.

One palustrine emergent wetland, WD-3 (totaling 4.54 acres), was identified and delineated, then rated in accordance to the *Washington State Wetland Rating System for Western Washington* (Washington Department of Ecology 2004). For consistency, the wetland delineated during this delineation was designated WD-3, the same as in the 2007 delineation. Wetland WD-3 is located north of Aries Road and is bordered by the airfield. This wetland was rated as a Depressional Category III wetland.

In addition to the 4.54 acres of wetland, a total of approximately 1,535 linear feet of artificial drainage ditch also occurs in the study area, conveying storm water along Clover Valley Creek to Dugualla Lagoon for discharge (via a pump system) into Puget Sound. On May 9, 2013, the USACE identified approximately 0.8 acre of wetland within a portion of a stormwater drainage ditch. This wetland is hydrologically connected to WD-3 and is considered part of the Depressional Category III wetland.

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°F	Fahrenheit
E & E	Ecology and Environment, Inc.
Ecology	Washington Department of Ecology
EIS	Environmental Impact Statement
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FR	Federal Register
JD	Jurisdictional determination
GPS	Global positioning system
HGM	Hydrogeomorphic
NAS Whidbey Island	Naval Air Station Whidbey Island
NRCS	Natural Resource Conservation Service
OBL	Obligate Wetland
P-8A	P-8A Multi Mission Aircraft
ROD	Record of Decision
RTK	Real Time Kinematic
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

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1.0 INTRODUCTION

1.1 Background and Purpose

As part of the analysis for the 2008 Final Environmental Impact Statement (EIS) *Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet*, six homebasing alternatives were considered at Naval Air Station Whidbey Island (NAS Whidbey Island) Island County, Washington. Alternative 5 was considered to best meet the mission requirements of the Navy while optimizing operational efficiencies related to training and contractor logistics support functions. A notice of the Record of Decision (ROD) was published in the Federal Register (FR) on January 2, 2009 (74 FR 100).

As part of the Final EIS analysis, three wetland delineations were performed by ecologists from Ecology and Environment, Inc. (E & E). The first delineation was conducted from June 5 to 8, 2007, and a second was conducted on October 10, 2007, both during the growing season. The third delineation was conducted on November 28, 2007, outside of the growing season. The results of these delineations were documented in a wetland delineation report (E & E 2008) that was submitted to the U.S. Army Corp of Engineers (USACE) in February 2008 as part of a request for jurisdictional determination (JD). Subsequently, the Navy received a JD from the USACE on April 9, 2008, concurring with all three of the NAS Whidbey Island wetland delineations.

Since the ROD was published, the Navy has determined that homebasing P-8A squadrons at two rather than three locations could provide potential cost savings while still meeting current strategic operational objectives. As such, the Navy is now preparing a Supplemental EIS to evaluate changes to the homebasing alternatives and analysis contained in the 2008 Final EIS. The Supplemental EIS will assess the potential effects of homebasing P-8A aircraft, the related changes in aircraft operations and personnel, and facility modifications and construction requirements.

The purpose of this report is to discuss the findings from performing a jurisdictional delineation within a 16-acre study area at NAS Whidbey Island. This area was previously considered in the 2008 Final EIS and was identified in the 2008 wetland delineation report (E & E 2008) as "Impact Area D." Wetlands in this area were included in the USACE's 2008 JD. Based on the findings observed by the USACE during their December 4, 2012, site visit, the USACE requested the Navy complete an additional delineation within 60 days of the USACE correspondence, dated December 18, 2012. E & E completed a delineation of the study area on February 1, 2013.

1.2 Study Area

Commissioned in 1942, NAS Whidbey Island is approximately 30 miles north of Seattle, located at the north end of Whidbey Island next to Oak Harbor (Figure 1-1). NAS Whidbey Island consists of four distinct parcels, Ault Field, Seaplane Base, Outlying Landing Field Coupeville, and Lake Hancock. Ault Field is the primary operational airfield for NAS Whidbey Island and includes an airfield composed of two intersecting runways, 07/25 and 13/31, each of which is approximately 8,000 feet long and 200 feet wide.

The general terrain of Ault Field is relatively flat and approximately 15 feet above mean sea level. Whidbey Island's location at the east end of the Strait of Juan de Fuca routinely exposes it to relatively cool, marine air passing eastward through the Strait. As this portion of Whidbey Island is situated in the rain shadow of the Olympic Mountains, precipitation averages between

18 and 20 inches per year (Ness 1958; Washington Department of Ecology [Ecology] 2006). Temperatures are generally moderate, with mean summer highs in the mid-70s Fahrenheit (^{o}F) and mean winter lows in the mid-30s^{o}F (Weather.com 2013).

The soils of Island County originated largely from glacial drift, consisting of sand, gravel, and some clay (Ness 1958). In places the soil is mixed with stones and boulders, some more than a foot in diameter. This drift was deposited in moraines left by glaciers that once moved over the Puget Sound area from the north. Locally, the drift is stratified.

The study area encompasses approximately 16 acres on NAS Whidbey Island, a portion of which may be impacted by new development to support the P-8A homebasing (Figure 1-2). The study area evaluated was larger than the maximum construction footprint being evaluated in the SEIS to allow for final design flexibility such that wetland impacts can be avoided to the greatest extent possible. It is located to the south of the Ault Field airstrip, in a portion of Section 23 in Township 33 North, Range 1 East (U.S. Geologic Survey 1973). This area is accessible by paved roads (Kitty Hawk Road and Aries Road). The Navy understands that any and all future development within the study area which would impact wetlands is contingent upon regulatory approval.

Source: ESRI, Delorme, NAVTEQ, USGS 2012; NAVFAC GeoRediness Center, 2006; NAS Whidbey Island, 2013.

Figure 1-1
Project Vicinity Map - NAS Whidbey Island
Whidbey Island, Washington

© Ecology & Environment, Inc. GIS Department Project EE-003872-0001-07TTO
M:\VA_Beach\MMA\2013\Maps\MXD\Reports\Wetland_Delineation_Report\study_area.mxd 3/20/2013

Source: ESRI, 2011; USGS Topo 1981; Ecology & Environment Inc. 2013; NAS Whidbey Island 2013.

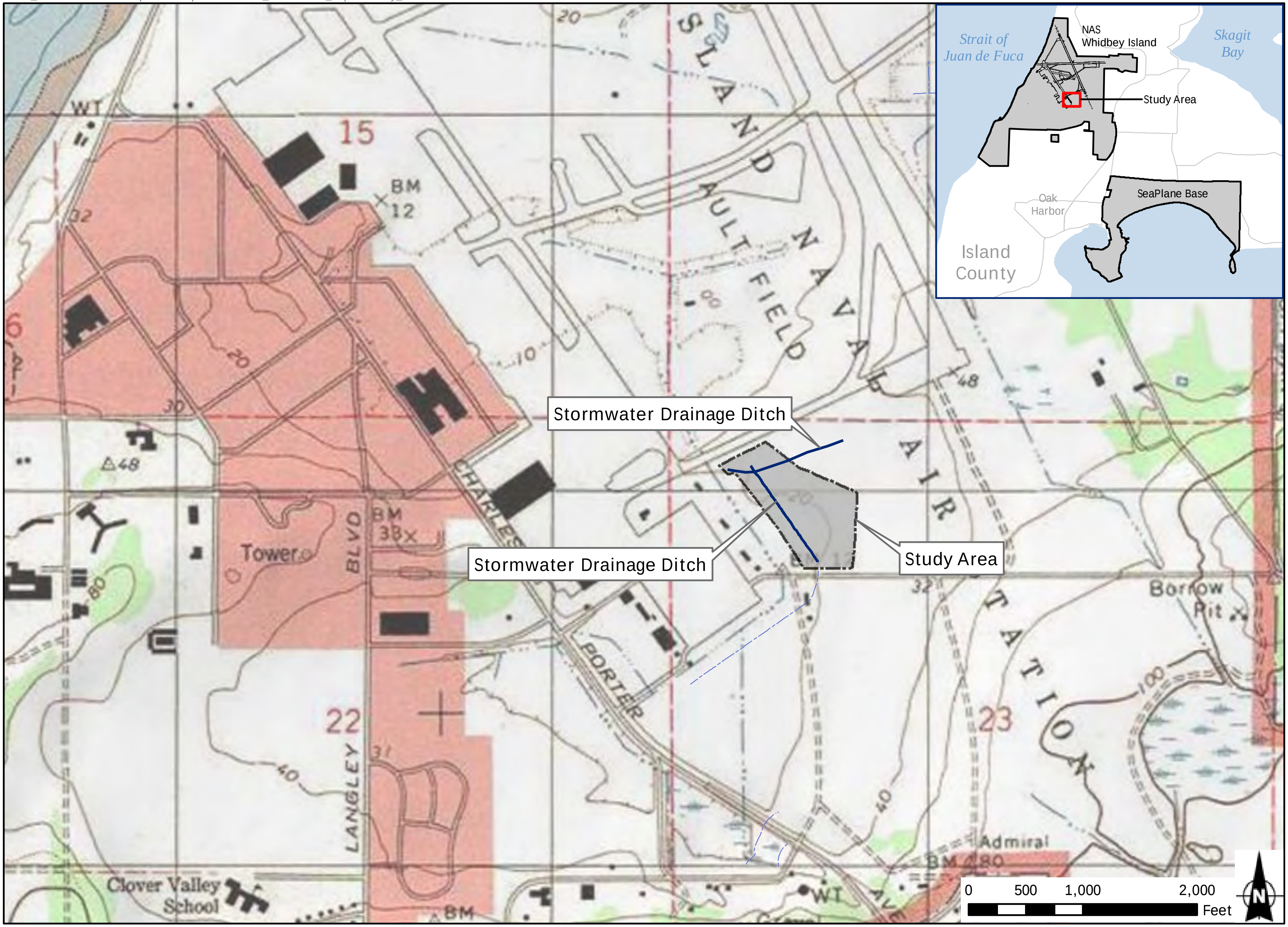

Figure 1-2
Location of Study Area at NAS Whidbey Island
NAS Whidbey Island, Island County, Washington

2.0 METHODOLOGY

This section describes the definition of wetlands and accepted criteria used to identify wetlands at NAS Whidbey Island.

Wetlands are defined as:

> "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, marshes, and similar areas" (U.S. Environmental Protection Agency, 40 Code of Federal Regulations 230.3, 33, and 328.3; Federal Register 1982).

The wetland delineation methodologies used in this study are described in the *1987 U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2008), which is intended to be used as a guide for determining whether an area is classified as wetland. According to this manual, an area must exhibit evidence of at least one positive wetland indicator from each of three parameters, soils, hydrology, and vegetation, to be defined as a wetland (see Section 2.1.1 for further details pertaining to the Western Mountains region; Environmental Laboratory 1987).

A list of plants able to tolerate saturated soil conditions has been prepared by the U.S. Fish and Wildlife Service (USFWS) for the Pacific Northwest region (Reed 1988, 1993). The growing season is defined as the portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biological zero (41^{o}F; USACE 2008). The growing season is usually approximated by the number of frost-free days for an area (Ecology 1997), approximately March 10 through November 17 in western Washington State.

2.1 Characteristics of Hydric Soils

The National Technical Committee for Hydric Soils has developed criteria for hydric soils and published a list of the nation's hydric soil types (U.S. Department of Agriculture [USDA] Soil Conservation Service 1991). Hydric soils are defined as soils that are flooded, ponded, or saturated long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (USDA Soil Conservation Service 1991). Anaerobic conditions are created when flooding, ponding, or saturation is of sufficient duration to result in the absence of oxygen from the environment. These soils usually support hydrophytic vegetation. Due to their saturated condition during the growing season, hydric soils usually develop certain morphological features that can be observed in the field. A prolonged anaerobic environment typically results in the accumulation of organic matter and/or lowers the soil reduction-oxidation, or redox, potential and causes a chemical reduction of soil components, such as iron and manganese oxides. This reduction affects solubility, movement, and aggregations of these oxides, which are reflected in soil colors.

The duration and depth of soil saturation are used to identify hydric soils and wetlands. Soil physical features, such as color, are commonly used to indicate long-term soil moisture regimes. As no organic soils were observed within the study area, only the characteristics of mineral soils are described in further detail. The most widely recognized colors that reflect wetness in mineral soils are low chromas (grayish) with or without redox features (concentrations or depletions) including iron/manganese soft masses or pore linings. Redox concentrations are the areas of oxidized iron that have become concentrated in patches and along root channels and other pores after a soil has reverted to an aerobic state (USACE 2008). Redox depletions are those areas that have lost iron and therefore typically develop characteristic gray or reddish-gray colors.

Subsurface horizons in hydric soils are predominately neutral gray in color and occasionally greenish or bluish. The distinctive colors result from a process known as *gleization*, in which prolonged saturation of mineral soil converts iron from its oxidized (ferric) form to its reduced (ferrous) state. The reduced compounds may be completely removed from the soil, resulting in low chromas. Mineral soils that are always saturated are uniformly gleyed throughout the saturated zone. Soils gleyed to the upper surface layer (within 12 inches of the surface) are hydric soils.

Mineral soils that are alternately saturated and oxidized (aerated) during the year are usually mottled in the part of the soil that is seasonally wet. Mottles are spots or blotches of contrasting colors or shades of colors interspersed with the dominant (matrix) color. The abundance, size, and color of the mottles usually reflect the duration of the saturation period. Mineral soils that are predominately grayish with brown or yellow mottles in the upper 20 inches are usually saturated for long periods during the growing season and are commonly classified as hydric. Color chromas of two or less using the Munsell Color System are considered “low chromas” and are often diagnostic of hydric soils (Munsell Color 1990). Examples of soils that would be classified as hydric include but are not limited to 5YR 5/1 and 10YR 4/2. Low chroma colors include black, various shades of gray, and darker shades of brown and red. Soils that are predominately brown or yellow with few gray mottles may be saturated for shorter periods and are not generally hydric. Mineral soils that are never saturated are usually brightly colored and are not mottled. Examples of soils that would not be classified as hydric include 5YR 5/4 and 10YR 7/3.

2.2 Characteristics of Wetland Hydrology

Permanent or periodic inundation (where soil is saturated within the rooting zone, at least seasonally) is the hydrologic force behind wetland formation. The presence of water for 5 percent or more of the growing season typically creates an anaerobic condition in the soil, which affects the types of plants that grow and the types of soils that develop (Environmental Laboratory 1987).

Numerous factors influence the wetness of an area: precipitation, stratigraphy (i.e., layering), topography and micro-relief, and soil permeability. The water found in wetlands may come from direct precipitation, overbank flooding, surface water runoff, groundwater discharge, or tidal flooding. The frequency and duration of inundation and soil saturation vary widely from permanent flooding or saturation to intermittent flooding or saturation (see Section 2.2). Duration is usually the most important factor affecting soils and vegetation. Soil permeability, which is affected by soil texture and density, also influences the duration of inundation or soil saturation. For example, soils with high clay content generally have lower permeabilities, absorb water more slowly, and, therefore, remain saturated for a longer period of time than sandy or loamy soils.

Of the three technical criteria for wetland identification, wetland hydrology is often the least exact and most difficult to characterize, primarily because of annual, seasonal, and daily fluctuations in water level. An area has wetland hydrology when saturated within the rooting zone (usually within 12 inches of the surface) for at least 5 percent (approximately 12.5 days) of the growing season.

The USACE defines the water table as the upper surface of groundwater or the level below which the soil is saturated with water (Environmental Laboratory 1987). A water table is at least 6 inches thick and persists in the soil for more than a few weeks. Field indicators used as evidence of wetland hydrology include one or more primary indicator such as surface water, high water table, or saturation. Two or more secondary indicators may also be used as evidence of wetland hydrology, such as ordinary high water marks, drift lines, drainage patterns, water marks, sediment deposition, vegetation morphology (e.g., adventitious roots), and presence or absence of algae or moss.

2.3 Characteristics of Hydrophytic Vegetation

Hydrophytic vegetation is defined as macrophytic plant life growing in water or soil or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content (Environmental Laboratory 1987). Vascular plants are classified into five groups according to their affinity for wetland areas (Reed 1988). The group to which a particular species is assigned determines its indicator status (i.e., probability of being found in a wetland). The vegetation indicator status ratings are defined below (Reed 1988, 1993):

- **Obligate Wetland.** Plants occur almost exclusively under natural conditions in wetlands (estimated probability greater than 99 percent).

- **Facultative Wetland.** Plants usually occur in wetlands (estimated probability of 67 to 99 percent) but are occasionally found in non-wetlands.

- **Facultative.** Plants are equally likely to occur in wetlands and non-wetlands (estimated probability 34 to 66 percent).

- **Facultative Upland.** Plants usually occur in non-wetlands (estimated probability 67 to 99 percent) but are occasionally found in wetlands (estimated probability 1 to 33 percent).

- **Obligate Upland.** Plants may occur in wetlands in another region but almost always occur under natural conditions in non-wetlands in the region specified (estimated probability of greater than 99 percent).

Wetland indicator categories should not be equated to degrees of wetness. Many Obligate Wetland species occur in permanently or semi-permanently flooded wetlands, but a number also occur in, or are restricted to, wetlands that are only temporarily or seasonally flooded. The actual frequency of occurrence of a species in wetlands may be anywhere within the frequency range of the indicator category. For example, a species assigned to the Facultative Upland indicator category may actually have a frequency toward the lower end of the category, while another species may have a frequency toward the upper end of the category (Reed 1993).

The presence of hydrophytic vegetation is determined using the wetland indicator status of species encountered. Hydrophytic plants are those rated as Facultative Wetland species or wetter as defined by Reed (1988, 1993). Wetland boundaries are identified based on the presence of a wetland plant community rather than any one particular indicator species. For example, a plant community with scattered individual upland species but dominated by hydrophytic species is considered to be a wetland plant community. Within each wetland, specific communities are determined on the basis of their dominant plant species, soils, and hydrology. Plant nomenclature used in this report follows *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973).

2.4 Classification

This section describes the different classes of wetlands and the criteria used to classify them. These criteria were used to classify wetlands at NAS Whidbey Island, as discussed in the sections below.

Wetlands delineated in the study area are classified using the USFWS wetland hierarchical classification system (Cowardin et al. 1979). This system classifies wetlands according to hydrologic, geomorphologic, chemical, and biological factors. Wetlands are first classified by the primary source of water to the wetland. These classes are usually identified by the physical form of the dominant vegetation community type or, less often, the substrate of the wetland. The Cowardin et al. (1979) primary systems are as follows:

- **Palustrine Systems** are shallow ponds and wet areas, including all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. This system also includes wetlands lacking such vegetation but with all of the following four characteristics: (1) total area is less than 20 acres; (2) active wave-formed or bedrock shoreline features are lacking; (3) water depth in the deepest part of the basin is less than 6.6 feet at low water; and (4) salinity, due to ocean-derived salts, is less than 0.5 part per thousand.

- **Lacustrine Systems** are lakes and deep ponds. Lacustrine Systems include wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) trees, shrubs, persistent emergents, emergent mosses, or lichens with less than 30 percent aerial coverage; and (3) total area exceeds 20 acres. Similar wetland and deepwater habitats totaling less than 20 acres are also included in the Lacustrine System if an active wave-formed or bedrock shoreline feature makes up all or part of the boundary, or if the water depth in the deepest part of the basin exceeds 6.6 feet at low water. Lacustrine waters may be tidal or non-tidal, but ocean-derived salinity is always less than 0.5 part per thousand.

- **Marine Systems** consist of open ocean overlying the continental shelf and its associated high-energy coastline. Marine habitats are exposed to the waves and currents of the open ocean, and the water regimes are determined primarily by the ebb and flow of oceanic tides. Salinities exceed 30 parts per thousand, with little or no dilution, except outside the mouths of estuaries. Shallow coastal indentations or bays without appreciable freshwater inflow and coasts with exposed rocky islands that provide the mainland with little or no shelter from wind and waves are also considered part of the Marine System because they generally support typical marine biota.

- **Estuarine Systems** consist of deepwater tidal habitats and their adjacent tidal wetlands, which are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may periodically increase above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of seawater. Offshore areas with typical estuarine plants and animals are also included in this system.

- **Riverine Systems** include all wetlands and deepwater habitats contained within a channel, except: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens; and (2) habitats with water containing ocean-derived salts in excess of 0.5 parts per thousand.

Systems are then divided into more specific categories called subsystems, although there are no subsystems in the Palustrine System. The classification system further subdivides wetlands into different classes based on general appearance of the life form in the plant community (e.g., trees, shrubs, aquatic vegetation; see Table 2-1). The class Forested Wetland is characterized by woody vegetation that is 19.7 feet or taller and greater than 3 inches in diameter at breast height. The class Scrub-Shrub Wetland is dominated by multi-stemmed woody vegetation less than 19.7 feet in height. This class includes shrubs, sapling trees, and trees that are small or stunted due to environmental conditions. The class Emergent Wetland consists of erect, rooted, herbaceous vascular plants, which excludes mosses and lichens.

The determination of wetland classes is based on the following criteria: if vegetation covers 30 percent or more of the substrate, then the class is distinguished on the basis of the life form of the plants that constitutes the uppermost layer of vegetation and that possesses an aerial coverage of 30 percent or greater. For example, an area with 50 percent areal coverage of trees over a shrub layer with 60 percent areal coverage would be classified as Forested Wetland; an area with 20 percent areal coverage of trees over the same (60 percent) shrub layer would be classified as Scrub-Shrub Wetland. When trees or shrubs alone cover less than 30 percent of an area but in combination cover 30 percent or more, the wetland would be assigned to the class Scrub-Shrub Wetland. When trees and shrubs together cover less than 30 percent of the area but the total cover of vegetation is 30 percent or greater, the wetland would be assigned to the appropriate class for the predominant life form below the shrub layer.

Finer differences in life form are recognized at the subclass level. For example, during this study, the only Forested Wetland subclass (and its classification code) encountered during surveys was "1 – Broad-Leaved Deciduous," the only Scrub-Shrub Wetland subclass encountered during field surveys was "1 – Broad-Leaved Deciduous," and the only Emergent Wetland subclass was "1 – Persistent."

Table 2-1. Palustrine System Classes and Subclasses

RB – ROCKY BOTTOM 1 – Bedrock 2 – Rubble **UB – UNCONSOLIDATED BOTTOM** 1 – Cobble-Gravel 2 – Sand 3 – Mud 4 – Organic **AB – AQUATIC BED** 1 – Algal 2 – Aquatic Moss 3 – Rooted Vascular 4 – Floating Vascular 5 – Unknown Submergent 6 – Unknown Surface **US – UNCONSOLIDATED SHORE** 1 – Cobble-Gravel 2 – Sand 3 – Mud 4 – Organic 5 – Vegetated	**ML – MOSS-LICHEN** 1 – Moss 2 – Lichen **EM – EMERGENT** 1 – Persistent 2 – Nonpersistent **SS – SCRUB-SHRUB** 1 – Broad-Leaved Deciduous 2 – Needle-Leaved Deciduous 3 – Broad-Leaved Evergreen 4 – Needle-Leaved Evergreen 5 – Dead 6 – Deciduous 7 – Evergreen **FO – FORESTED** 1 – Broad-Leaved Deciduous 2 –Needle-Leaved Deciduous 3 – Broad-Leaved Evergreen 4 – Needle-Leaved Evergreen 5 – Dead 6 – Deciduous 7 – Evergreen **OW – OPEN WATER/UNKNOWN BOTTOM**

Source: Cowardin *et al.* (1979)

Non-tidal water regime modifiers developed by Cowardin et al. (1979) are also used to categorize the hydrology of the wetland communities. The water regime of each wetland class is inferred from field observation of inundation, water depth, vegetation type and species, drift lines, water marks on trees, leaf staining, and obvious soil surface features (e.g., gravels). The following describes the water regime modifiers and their classification codes:

- **Permanently Flooded.** Water covers the land surface throughout the year in all years, and vegetation is composed of obligate species.

- **Intermittently Exposed.** Surface water is present throughout the year, except in years of extreme drought.

- **Semipermanently Flooded.** Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

- **Seasonally Flooded.** Surface water is present for extended periods, especially early in the growing season, but is absent by the end of the season in most years.
- **Seasonal/Semipermanently Saturated.** The substrate is saturated to the surface for most of the year, and pockets of surface water may appear during the growing season.
- **Saturated.** The substrate is saturated to the surface for extended periods during the growing season, but surface water is seldom present.
- **Temporary Flooded.** Surface water is present for brief periods during the growing season, but the water table is usually located well below the soil surface for most of the season (plants that grow both in uplands and wetlands are characteristic of this regime).
- **Intermittently Flooded.** The substrate is usually exposed, but surface water is present for variable durations without detectable seasonal periodicity.

2.5 Functions and Values Assessment

This section describes the criteria for assessing functions and values of wetlands. These criteria were used to classify wetlands at NAS Whidbey Island, as discussed in the sections below.

Wetland values are those characteristics of a wetland that are deemed beneficial to society. The values that wetlands provide can be aesthetic, recreational, or educational in nature or can relate to wildlife habitat or scientific opportunities. The functions and values of wetlands vary depending on their physical, chemical, and biological characteristics. Possible functions of wetlands include groundwater recharge, groundwater discharge, flood-flow alteration, sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, production export, aquatic diversity/abundance, and wildlife diversity/abundance (USACE 1991). Wetlands that perform important functions in relation to wildlife and fish habitat may have some or all of the following characteristics: (1) proximity to watercourses such as streams and rivers; (2) large size; (3) diverse types and species of vegetation; (4) several layers of vegetation; and (5) habitat for threatened, endangered, or sensitive species of plants or animals. A brief description of different wetland functions is provided below.

2.5.1 Groundwater Recharge

Groundwater recharge occurs when surface water moves into groundwater in either wetlands or uplands. The substrate largely determines the rate of water movement. Groundwater moves more quickly through coarse substrates, such as gravels, and more slowly through fine material, such as clay and accumulated organic matter. Wetlands above a low-permeability soil layer contribute less to groundwater recharge than those with a more permeable substrate. Wetlands with inlets and no outlets are also likely to recharge groundwater because as water in such wetlands stays in contact with the substrate longer than in wetlands with surface outlets. Generally, only large wetlands provide enough groundwater recharge to be of interest to society as a water supply. Shallow and lateral recharge are local phenomena of direct value to fewer water users than deep recharge, which is more pertinent to regional groundwater systems. In areas where wetlands are a small percentage of the surface area, most groundwater recharge occurs in upland areas.

2.5.2 Groundwater Discharge

Groundwater discharge occurs when groundwater becomes surface water. Seeps from coarse substrates surrounding wetlands can discharge groundwater, but this discharge can be difficult to identify if the point of discharge is below the surface of the water. Discharge of groundwater to a wetland is more likely to occur when a wetland is located at the bottom of a slope than in a level topographic area. Wetlands with outlets and no inlets are more likely to be groundwater supplied. In addition, if the inputs are primarily from precipitation, then groundwater discharge to a wetland is less probable. Wetlands in areas that experience a precipitation deficit, such as the wetlands in eastern Washington, are more likely to benefit from groundwater recharge than areas that experience abundant precipitation, such as the wetlands in western Washington.

2.5.3 Flood-Flow Alteration

Flood-flow alteration is a process that occurs when peak flows from runoff, surface flow, groundwater flow, and direct precipitation enter a wetland and are stored or delayed in moving down slope. Almost any depression in the landscape can function to store peak flows. The importance of this function is increased in areas that receive intense storms and have steep slopes, which result in a rate of surface runoff greater than the rate of infiltration.

2.5.4 Sediment Stabilization

Sediment stabilization refers to: (1) the anchoring and stabilization of soil by plants at the edge of water bodies; and (2) the dissipation of erosive forces such as waves, currents, ice, water-level fluctuations, and groundwater flow. Wetlands can function to stabilize sediment exposed to these erosive forces. For example, riverine, marine, and estuarine systems are typically characterized by flowing water, and wetlands within these systems tend to stabilize sediment. In addition, forested and scrub-shrub wetlands have more vegetation to stabilize sediment than wetlands with little vegetation.

2.5.5 Sediment/Toxicant Retention

Retention of sediments and toxicants occurs when suspended solids and chemical contaminants, such as pesticides and heavy metals, adsorb to these solids. Most vegetated wetlands are excellent sediment traps. In order to serve this function, however, sediments must be transported in surface flow from disturbed uplands and discharged into the wetland. The erosive potential of upland areas, which depends on the soils, slope steepness, and vegetative cover, also influences the ability of wetlands to support this function. Wetlands with inlets and constricted outlets are more likely to retain deposited sediments and toxicants.

2.5.6 Nutrient Removal/Transformation

Nutrient removal/transformation involves the processes of nutrient storage (mostly nitrogen and phosphorus) within sediments or plant substances, transformation of inorganic nutrients to their organic forms, and transformation and subsequent removal of nitrogen gas. The removal of nutrients by plants from waters and sediments during the growing season and subsequent release when low light or temperature reduces algae growth is a common function of wetlands that is important in maintaining water quality. Wetlands with a high density of vegetation and a low water-flow gradient remove/transform more nutrients than wetlands with a low density of vegetation and a steep gradient. Furthermore, more nutrients are removed/transformed in wetlands with inlets and constricted outlets because the residence time of the water is longer. The ability of wetlands to remove/transform nutrients also depends on the soil characteristics and the amount of nutrients flowing into the wetland.

2.5.7 Production Export

Production export is the process of producing and flushing organic matter out of a wetland, usually downstream. The ability of a wetland to perform this function depends on size, hydrologic mixing, and discharge mechanism. Vegetated wetlands with steep water-flow gradients and outlets are more likely to function in production export than wetlands lacking these features. The transport of organic matter can be important for insect and fish production.

2.5.8 Aquatic Diversity/Abundance

Aquatic diversity/abundance refers to the ability of a wetland to support a diversity and/or abundance of fish or invertebrates. Large wetlands and those connected to oceans, rivers, or streams are more likely to perform this function at a higher level.

2.5.9 Wildlife Diversity/Abundance

Wildlife diversity/abundance refers to the ability of a wetland to support a diversity and/or abundance of wildlife. Wetlands that support a diversity or abundance of wildlife are often large, near tidal waters or rivers, contain a high interspersion of different vegetation classes, possess islands, and are exposed to minimal human disturbance.

2.6 Wetland Rating System

Wetlands identified during this survey were rated using the *Washington State Wetlands Rating System for Western Washington* (Ecology 2004). This rating system categorizes wetlands based on their functions and values in the landscape, sensitivity to disturbance, rarity, and irreplaceability. These wetlands can further be classified using the hydrogeomorphic (HGM) system, which groups wetlands into categories based on their geomorphic and hydrologic characteristics. Wetlands are divided into four categories briefly described below:

Category I Wetlands that: (1) provide habitat for threatened or endangered plants, animals, or fish species; (2) are documented or qualify as high-quality Natural Heritage wetland sites; (3) are documented as having regional (Pacific Coast) or national significance for migratory birds; (4) represent a high-quality example of a rare native wetland community; or (5) provide relatively irreplaceable ecological functions.

Category II Wetlands that: (1) provide habitat for sensitive or important plant, animal, or fish species; (2) contain priority habitats and species documented by the Washington Department of Fish and Wildlife's *Priority Habitats and Species Program*; (3) have significant functions that may not be adequately replicated through creation or restoration; or (4) provide high functions, particularly for wildlife.

Category III Wetlands that (1) provide important functions and values; or (2) have been identified as a Category III wetland because of local significance.

Category IV Wetlands that (1) are relatively small (less than 2 acres); (2) are hydrologically isolated; or (3) are dominated by either one or a few species specified for rating as a Category IV wetland.

Wetlands are rated following delineation of their boundaries, and wetlands that are hydrologically connected are rated as one contiguous wetland; however, there can be numerous wetland communities within one wetland. Typically, extensive wetlands within river valleys that are separated by changes in volume, flow, or velocity of water may be rated independently.

2.7 Pre-Field Evaluation

Prior to engaging in field work, E & E staff reviewed background reference materials to familiarize personnel with the study area. These materials included a wetland delineation report of NAS Whidbey Island, completed in 2008 (E & E 2008); U.S. Geologic Survey topographic maps (Oak Harbor quadrangle; U.S. Geologic Survey 1973), Google earth aerials, National Wetland Inventory (USFWS 2013), the National Cooperative Soil Survey's web soil survey (Natural Resource Conservation Service [NRCS] 2013), and the Island County Area Soil Survey (NRCS 2008).

2.8 Field Evaluation

2.8.1 Wetland Delineation

A wetland delineation of the study area was conducted by E & E on February 1, 2013. This survey was conducted to identify and delineate wetlands, assess the wetlands functions and values, and estimate the ratings for each identified wetland.

Field data collected during the delineation were recorded on "Wetland Determination Data Form: Western Mountains, Valleys, and Coast Region" datasheets (Appendix A). A wetland rating, using the *Western Washington Wetland Rating System* (Ecology 2004), was also conducted for each delineated wetland (Section 2.6; Appendix B). In general, after preliminary identification of potential wetland areas based on vegetation and hydrology, the following activities were performed at each location to assist in verifying the presence of a wetland and the wetland boundaries:

- Hydrological characteristics of the area were assessed to determine the capability of the area to pond surface water and to support possible inflow and outflow of water or to be saturated in the upper 12 inches of soil for 5 percent of the growing season. Evidence of hydrology included: inundation, drainage patterns, drift lines, watermarks, sediment deposition, water-stained leaves, and hydrophytic vegetation morphology (e.g., adventitious roots).

- Plant species that were observed in the wetland and adjacent upland areas assisted in delineating the wetland boundaries. The dominant plant species, along with their indicator status, were recorded. More than 50 percent of dominant plant species must be Facultative or wetter for a sample plot to have hydrophytic vegetation.

- Soil survey pits were dug using a shovel to approximately 14 inches or until cobbles were reached to help determine the presence of hydric soils and the boundaries of wetlands. The depth to the water table, if it was encountered within the soil survey pit, was recorded after a few minutes (allowing for the water table to stabilize). The soil profile was described using the standard classification system (USDA Soil Conservation Service 1981). Soil color was described using Munsell Color charts (1990).

- Each wetland was classified according to the USFWS hierarchical classification system developed by Cowardin et al. (1979).

Results of this survey were compared with available publications, including the web soil survey and the Island County Area Soil Survey (NRCS 2008, 2013).

2.8.2 Wetland Survey

On February 5, 2013, wetland flag locations were surveyed by White Shield Inc., a licensed surveyor in Washington State. White Shield Inc. used a Trimble R-8 Geodetic Grade Global Positioning System (GPS) receiver (dual frequency), operating in Real-Time Kinematic (RTK) mode, to map wetland community boundaries. Primary control was established from a Washington Department of Transportation published control station located along State Route 20 near NAS Whidbey Island during a previous project phase.

Operating in RTK GPS mode, “fixed-solutions” were used to record the horizontal and vertical coordinates along with point attributes (flag labels). Additional key topography spot elevations were also collected. Estimated accuracy was ±1 inch. Trimble Business Center (Version 2.73) was used for quality control of RTK GPS observations and generation of ASCII point data. This point information was exported to a database format using ArcView and edited before linking with geographic information system. All maps were created by E & E using these digitized data.

3.0 WETLAND DELINEATION FINDINGS

An approximately 16-acre study area was surveyed, of which approximately 4.54 acres contained wetland habitat (WD-3) (Figure 3-1; see Section 6 [Photolog]). As stated in Section 1.1, the area was previously surveyed in 2008 for the Final EIS. A portion of the wetland delineated in the area at that time was designated WD-3. For consistency, the wetland delineated during this delineation has also been designated WD-3.

Wetland WD-3 is located east of the airfield facilities, north of Aries Road. In addition, a total of approximately 1,535 linear feet of artificial drainage ditch occurs in the study area (Photolog 3), conveying storm water along Clover Valley Creek to Dugualla Lagoon for discharge (via a pump system) into Puget Sound.

Weather during the February field survey was overcast and cool; weather conditions the week prior to this field effort included heavy rain and cold temperatures (i.e., less than 50 °F). This delineation was completed outside of the growing season at the request of the USACE in a December 18, 2012, letter to the Navy.

The wetland identified in the study area was classified as a Palustrine System because it was dominated by persistent emergent vegetation, was less than 20 acres, did not have wave-formed or bedrock shoreline features, and had a water depth of less than 6.6 feet. The wetland can be placed in one HGM type: depressional (Ecology 2004).

3.1 Local Soil Types

The *Island County Area Soil Survey* identified the soils in the areas of delineation as a Sholander, cool-Spieden complex, 0 to 5 percent slopes (NRCS 2008, 2013).

Sholander, cool-Spieden complex, 0 to 5 percent slopes, occupies valleys, with a parent material made up of glacial outwash over dense glaciomarine deposits. This soil is a somewhat poorly drained to poorly drained soil, with a seasonally high water table of between 4 and 12 inches (minimum depth), although it does have a moderately high to very high capacity to drain water. The natural vegetation consists of scrub-shrub and evergreen trees.

To a depth of 0 to 8 inches, the typical soil profile contains a very dark grayish brown to very dark brown gravelly loam. This top layer has a subangular blocky structure, predominantly made up of 10 percent gravel, 5 percent cobbles, and 5 percent stones. From 8 to 16 inches the soil is typically a light brownish gray to dark grayish brown gravelly sandy loam with a coarse subangular blocky structure. Beyond 16 inches, the soil is typically a brown gravelly loamy sand.

3.2 Wetland WD-3 Description

The following description of the onsite wetland is based on data collected by E & E during the February 1, 2013, field survey. Wetland WD-3 is a Palustrine Emergent Wetland located along the north side of Aries Road (Figure 3-1). The wetland is approximately 4.54 acres. The eastern boundary of the wetland appears to extend beyond the surveyed area; however, due to the timing of this delineation and onsite conditions observed at the time, it was not possible to determine the complete boundary of this wetland.

Due to the time of year this delineation was completed (i.e., February; outside of the growing season), herbaceous vegetation was difficult to identify to genus level (Photolog 4). Although many of the herbaceous species were not identifiable, remnants of the previous year's growth of *Phalaris arundinacea* (reed canarygrass) and traces of *Juncus* species (rush species) were identified.

Three wetland soil pits were dug; one at each sample plot. The soil profile in wetland pit 1 consisted of saturated silt clay loam (10YR 3/1) from 0 to 6 inches, with no redox features. Clay (10Y 5/1) with 20 percent redox features (10YR 5/8) occurred from 6 to 12 inches, with silty clay loam (10YR 2/1) from 12 to 20+ inches. Although no water was observed in the pit after 10 minutes, surface water ponding was observed within 15 feet of the sample plot.

The soil profile in wetland pit 2 consisted of saturated silty clay loam from 0 to 10 inches, with no redox features, and clay (10YR 5/1), with 10 percent redox features (10YR 5/8), from 10 to 20+ inches. Water was observed at 5 inches below ground surface after 10 minutes (Photolog 5). Surface water was also observed approximately 20 feet from the sample plot.

The soil profile in pit 3 consisted of saturated silty clay loam (10YR 3/1) from 0 to 20+ inches (Photolog 6). No redox features were observed. Water was observed at 7 inches below ground surface within 5 minutes, while surface water ponding was observed approximately 5 feet from the sample plot.

A gravel/dirt road bisects the WD-3 wetland (Photolog 7). A small drainage ditch runs parallel to this road and is then hydrologically connected to the stormwater ditch to the west of wetland WD-3 via a culvert under the road. After flowing into the stormwater ditch to the west of the wetland, water then flows via a series of stormwater ditches to Clover Valley Creek. Stormwater is then pumped over a dike into Dugualla Lagoon. It appeared during the delineation that the drainage ditch parallel to the road, flowing into the stormwater ditch, was poorly maintained. This poor maintenance of the drainage ditch reduced the flow of water from the study area, increasing the water level of the wetland (see Section 3.2.1).

Potential functions of this wetland include sediment/toxicant retention and removal, flood-flow alteration, and transformation of nutrients and sediments.

3.2.1 Changes in the Study Area Since 2007

Site conditions have changed since the November 28, 2007, delineation of this area. A review of aerial photographs taken of the area over the last 5 years, along with an assessment of onsite conditions, show hydrologic manipulation within the study area. This manipulation appears to be as a result of 1) a lack of regular ditch maintenance of both the stormwater ditch and the drainage ditch adjacent to the gravel road bisecting the wetland, and 2) surface disturbance approximately 80 feet east of the stormwater ditch that runs parallel to the ditch. This disturbance appears to have compacted soils along the right of way, forming a depressional area that has led to a ponding effect in the area. As a result, based on findings observed during the February delineation, the total area of WD-3 has increased by approximately 1.73 acres compared to the 2007 boundary.

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Source: ESRI, 2011; NAIP 2011; White Sheild Inc. 2013; Ecology & Environment Inc. 2013; NAS Whidbey Island 2013.

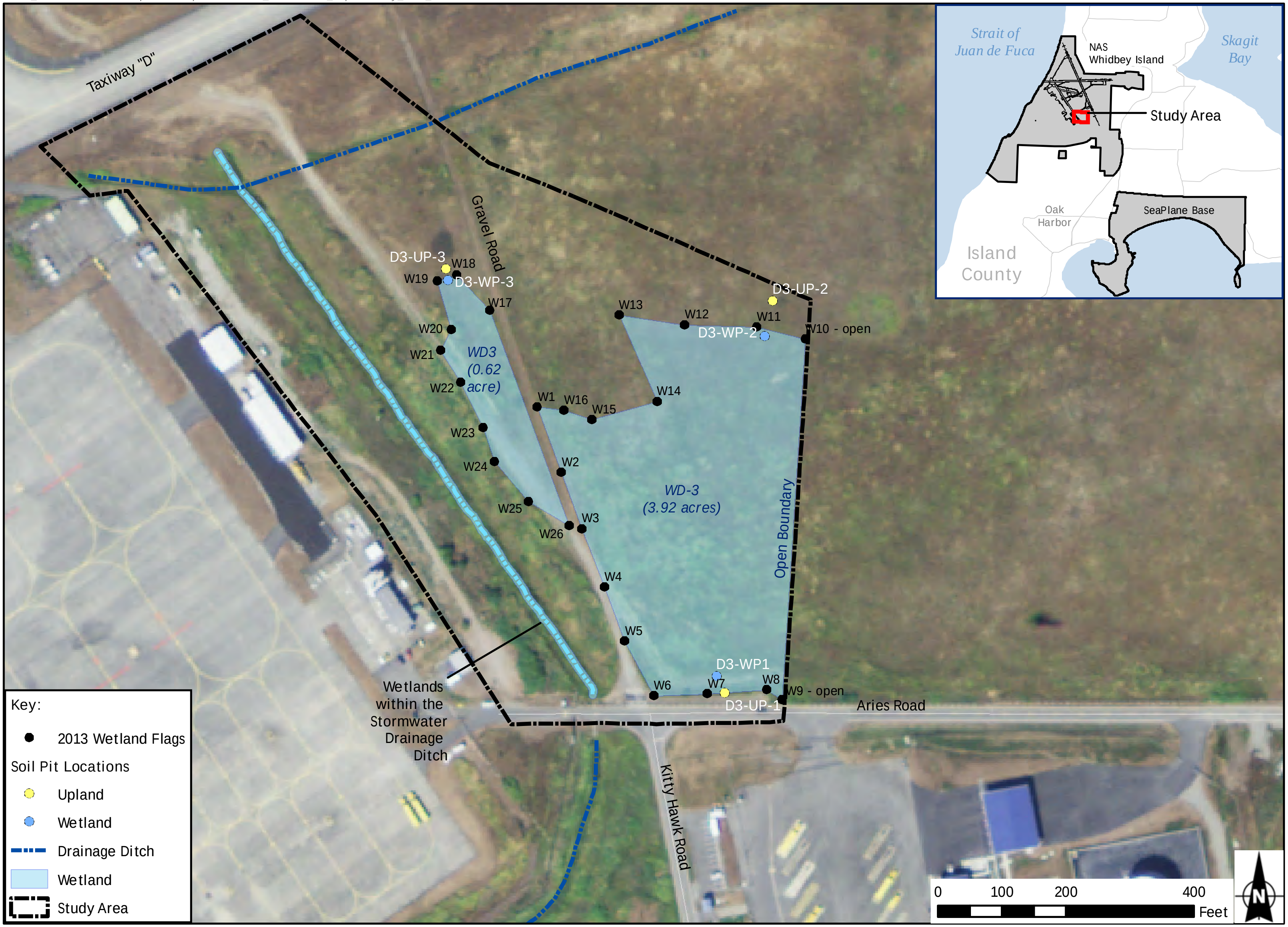

Figure 3-1
Location of On-Site Wetlands within the Study Area
NAS Whidbey Island, Island County, Washington

3.3 Wetland Rating of the Delineated Wetland

Wetland WD-3 was rated as Depressional HGM criteria and as a Category III wetland based on the rating form for western Washington.

3.4 Other Jurisdictional Waters of the U.S.

No naturally occurring rivers, streams, lakes, or ponds are present in or adjacent to the study area. A series of channelized, maintained ditches has been established throughout NAS Whidbey Island, including within the study area. The primary function of these ditches is to convey the station's stormwater.

A total of approximately 1,535 linear feet of artificial drainage ditch occurs in the study area. On May 9, 2013, the USACE completed a site visit of the delineated WD-3 wetland. The USACE's wetlands staff noted dense wetland vegetation and a permanent to semi-permanent source of water in the drainage ditch adjacent to Wetland WD-3. Based on these observations, the USACE indicated that wetlands may be present within the ordinary high water mark of this ditch. No subsequent wetland data were gathered to identify whether soils within this area were hydric. The Navy considers this area (approximately 0.8 acre) as wetland. This portion of the drainage ditch is hydrologically connected to WD-3 and is considered part of the Depressional Category III wetland.

As other ditches bisect the study area, waters from the adjacent wetland (WD-3) may also contribute to the waters in these ditches. Similarly, waters from surrounding wetlands may also contribute to waters in other ditches on the installation. This surface drainage system conveys water from Ault Field to Clover Valley Creek, which then flows east toward the Dugualla Lagoon and Dugualla Bay. The ditches are approximately 10 to 40 feet wide (measured from top of bank), have steep banks, and maintain water flow throughout most of the year (Photolog 3).

4.0 CONCLUSIONS

The introduction of the P-8A into the U.S. Navy fleet would require new construction of associated infrastructure and support facilities. As a result, the proposed action may affect baseline conditions specifically related to natural resources, particularly wetlands, at NAS Whidbey Island, Island County, Washington.

The purpose of this report is to discuss the findings from performing a jurisdictional wetland delineation within the 16-acre study area at NAS Whidbey Island. This area was previously surveyed in 2007 for the Final EIS. Based on the direction received from the USACE, a jurisdictional wetland delineation of the study area was performed by ecologists from E & E on February 1, 2013.

For consistency, the wetland delineated in the study area was designated WD-3, just as it was in the 2007 delineation (E & E 2008). Wetland WD-3 is located north of Aries Road and is bordered by the airfield. A total of 4.54 acres of Palustrine Emergent wetland was identified and delineated, then rated as a Depressional Category III wetland in accordance to the *Washington State Wetland Rating System for Western Washington*.

Disturbance in a portion of the study area appears to have compacted soils, forming a depressional area that has led to a ponding effect. This compaction, combined with the lack of drainage ditch maintenance has increased the total area of WD-3 by approximately 1.73 acres compared to its 2007 boundary.

In addition to the 4.54 acres of wetlands, a total of approximately 1,535 linear feet of artificial drainage ditches occurs in the study area, conveying stormwater along Clover Valley Creek to Dugualla Lagoon for discharge (via a pump system) into Puget Sound. A portion (0.8 acre) of the drainage ditches was identified by the USACE on May 9, 2013, as wetland. This wetland is hydrologically connected to WD-3 and is considered part of the Depressional Category III wetland.

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6.0 PHOTOLOG

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Source: ESRI, 2011; NAIP 2011; White Sheild Inc. 2013; Ecology & Environment Inc. 2013; NAS Whidbey Island 2013.

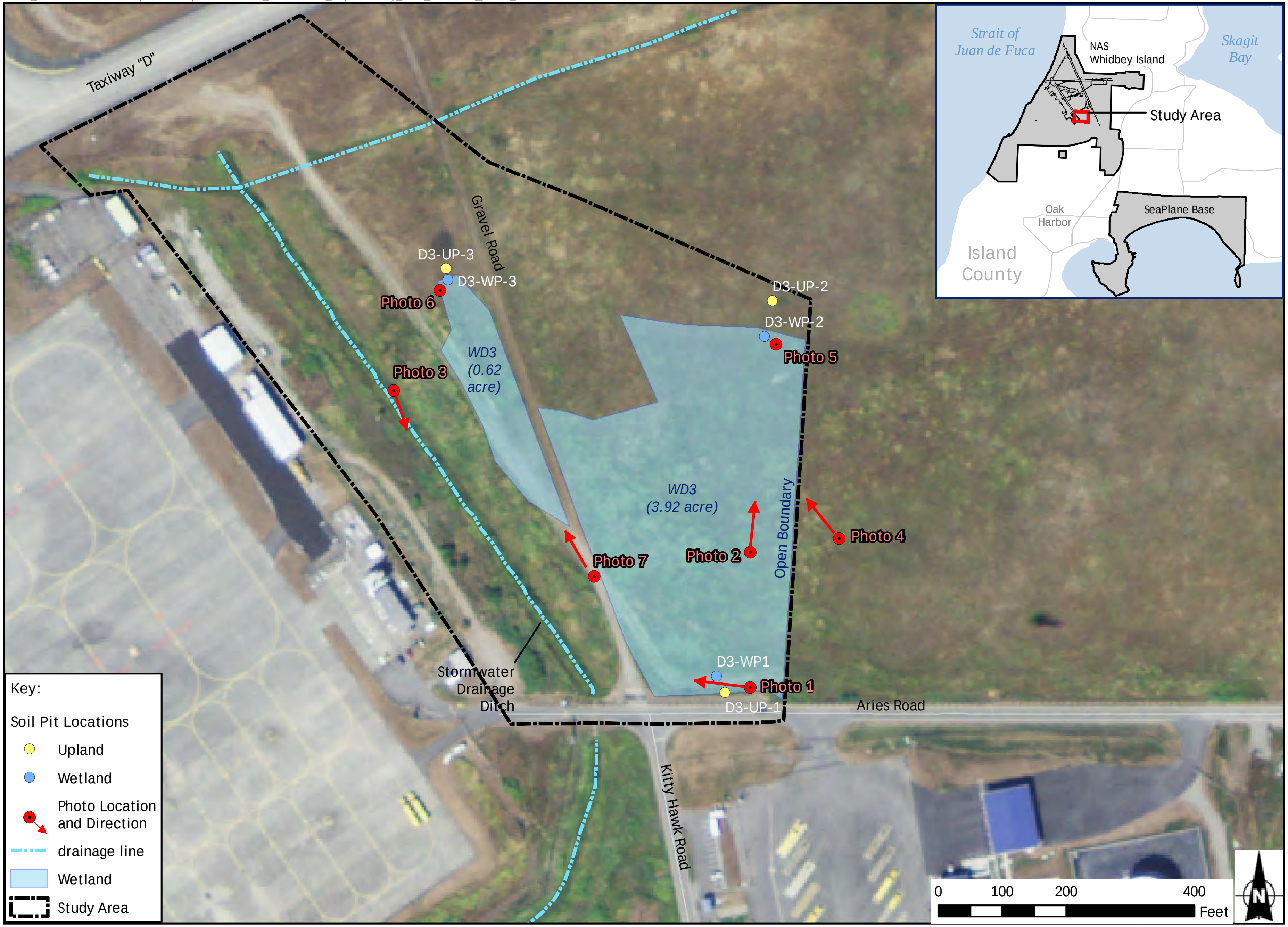

Figure 6-1
Photo Locations within the Study Area
NAS Whidbey Island, Island County, Washington

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PHOTOGRAPHIC LOG: 1

Client name: U.S. Navy	Site Location: WD3 NAS Whidbey Island, WA	Project No.: EE-003872-0001-05
Date: 02/01/13 Direction of Photo: Facing west Description: Example of vegetation stand observed in study area.		

PHOTOGRAPHIC LOG: 2

Client name: U.S. Navy	Site Location: WD3 NAS Whidbey Island, WA	Project No.: EE-003872-0001-05
Date: 02/01/13 Direction of Photo: Facing northeast Description: View of WD3 on the west side of the gravel road.		

PHOTOGRAPHIC LOG: 3		
Client name: U.S. Navy	**Site Location:** WD3 NAS Whidbey Island, WA	**Project No.:** EE-003872-0001-05
Date: 02/01/13 **Direction of Photo:** southeast **Description:** Stormwater ditch separating existing infrastructure and WD3.		

PHOTOGRAPHIC LOG: 4		
Client name: U.S. Navy	**Site Location:** WD3 NAS Whidbey Island, WA	**Project No.:** EE-003872-0001-05
Date: 02/01/13 **Direction of Photo:** Northwest **Description:** Example of vegetation stand observed in study area.		

PHOTOGRAPHIC LOG: 5		
Client name: U.S. Navy	**Site Location:** WD3 NAS Whidbey Island, WA	**Project No.:** EE-003872-0001-05
Date: 02/01/13		
Direction of Photo: N/A.		
Description: View of the wetland soil pit #2		

PHOTOGRAPHIC LOG: 6		
Client name: U.S. Navy	**Site Location:** WD3 NAS Whidbey Island, WA	**Project No.:** EE-003872-0001-05
Date: 02/01/13		
Direction of Photo: N/A.		
Description: View of the wetland soil pit #3		

PHOTOGRAPHIC LOG: 7		
Client name: U.S. Navy	**Site Location:** WD3 NAS Whidbey Island, WA	**Project No.:** EE-003872-0001-05
Date: 02/01/13 **Direction of Photo:** Facing north. **Description:** Road bisecting WD3. (Note: Drainage ditches on both sides of road)		

Appendix A

Wetland Determination Form

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WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: NASWI P-8A City/County: Island County Sampling Date: 2/1/2013

Applicant/Owner: US Navy/NAS Whidbey Island State: WA Sampling Point: WD3-UP1

Investigator(s): C. Fisher & B. Mackey Section, Township, Range: S23, T33N, R1E

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): None Slope (%): 5

Subregion (LRR): LRR A Lat: ______ Long: ______ Datum: NAD 83

Soil Map Unit Name: Sholander, Cool-Spieden Complex, 0-5% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?	✓	
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks: Sample plot UP1 is the paired upland plot to WP1 at the southern boundary of wetland D3, south of the stormwater drainage and north of Torpedo road. The sample plot is weedy and slightly disturbed due to road fill and/or stormwater ditch maintenance.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1. None			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. None			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Rubus armeniacus	25	Y	FACU
2. Poa spp./Agrostis spp. ?	65	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1. None			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	65	x 3 = 195
FACU species	25	x 4 = 100
UPL species	0	x 5 = 0
Column Totals:	90 (A)	295 (B)

Prevalence Index = B/A = 3.27

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: Due to winter delineation, herbaceous vegetation was not possible to identify to species and very difficult to identify to genus.

SOIL

Sampling Point: WD3-UP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR 3/1	100					silty clay	loam - soil moist, not saturated
13-20	10Y 5/1	95	10YR 5/8	5	6	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☑ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ✓ **No** ______

Remarks:

Soil pit is located adjacent to stormwater ditch but down slope from Torpedo Rd. fill. Soil meets indicator A12.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ____________

Wetland Hydrology Present? **Yes** ______ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water present in adjacent stormwater ditch approximately 4 feet lower in elevation than soil pit profile. No water or saturation observed in soil pits.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: NASWI P-8A City/County: Island County Sampling Date: 2/1/2013

Applicant/Owner: US Navy/NAS Whidbey Island State: WA Sampling Point: WD3-UP2

Investigator(s): C. Fisher & B. Mackey Section, Township, Range: S23, T33N, R1E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR): LRR A Lat: ______ Long: ______ Datum: NAD 83

Soil Map Unit Name: Sholander, Cool-Spieden Complex, 0-5% Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks: UP2 is the paired upland pit to WP2 at the northern boundary of wetland D3. UP2 is located approximately 20 feet from WP2 and 1 to 2 feet higher in elevation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. None			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Poa spp./Agrastis spp.?	50	Y	FAC
2. Unknown Grass ?	50	Y	?
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ______)			
1. None			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: Due to winter delineation, herbaceous vegetation was not possible to identify to species and very difficult to identify to genus.

SOIL

Sampling Point: WD3-UP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/2	100					Silty clay	loam
14-20	10YR 5/1	90	10YR 5/8	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ____ No ✓

Remarks:

Soil does not meet criteria for A12 because layer 0-12" has a chrome of 2.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ______

Water Table Present? Yes ____ No ✓ Depth (inches): 13"

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ______

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

After 10 minutes water in the pit filled to 13" below ground surface, just above the clay layer.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: NASWI P-8A City/County: Island County Sampling Date: 2/1/2013

Applicant/Owner: US Navy/NAS Whidbey Island State: WA Sampling Point: WD3-UP3

Investigator(s): C. Fisher & B. Mackey Section, Township, Range: S23, T33N, R1E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR): LRR A Lat: ______ Long: ______ Datum: NAD 83

Soil Map Unit Name: Sholander, Cool-Spieden Complex 0-5% Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?	✓	
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks: UP3 is the paired upland plot to WP3 at the northern boundary of the extension of wetland WD3. The plot is approximately 15' from WP3 and the boundary is characterized by a change in topography 1-2' and slight change in vegetation and surface water ponding.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Poa spp./Agrostis spp. ?	75	Y	FAC
2. Unknown Grass spp. ?	25	Y	?
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ______			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: Due to winter delineation, herbaceous vegetation was not possible to identify to species and very difficult to identify to genus.

SOIL

Sampling Point: WD3-UP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/1	100					Silty Clay	Loam
14-20	10Y 5/1	90	10YR 5/8	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☑ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ______

Remarks:

Soil meets criteria for A12.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ______	No ✓	Depth (inches): ______
Water Table Present?	Yes ______	No ✓	Depth (inches): 14
Saturation Present? (includes capillary fringe)	Yes ______	No ✓	Depth (inches): ______

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water observed in pit at depth of 14" below ground surface after 10 minutes.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: NASWI P-8A City/County: Island County Sampling Date: 2/1/2013

Applicant/Owner: US Navy/NAS Whidbey Island State: WA Sampling Point: WD3-WP1

Investigator(s): C. Fisher & B. Mackey Section, Township, Range: S23, T33N, R1E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR): LRR A Lat: ______ Long: ______ Datum: NAD 83

Soil Map Unit Name: Sholander, Cool-Spienden Complex, 0-5% Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?	✓	
Wetland Hydrology Present?	✓	
Is the Sampled Area within a Wetland?	✓	

Remarks: WD3 is a flat PEM wetland, historically grazed/agriculture and hydrologically influenced by stormwater ditches and groundwater. The wetland is bordered by a stormwater ditch and Torpedo Rd. to the south, a gravel road to the west, upland to the north, and the east border extends beyond the study area. Paired pits WP1 and UP1 were collected at the southern boundary

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1. None			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1. None			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Phalaris Arundinacea	50%	Y	FACW
2. Poa ssp./Agrostis spp?	50%	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1. None			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ______			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	50	x 2 = 100
FAC species	50	x 3 = 150
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	100 (A)	250 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: Due to winter delineation, herbaceous vegetation was not possible to identify to species and very difficult to identify to genus.

SOIL

Sampling Point: WD3-WP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					silty clay	loam
6-12	10Y 5/1	80	10YR 5/8	20	C	M	clay	
12-20	10YR 2/1	100					silty clay	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☑ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ____

Remarks:

Soil profile meets A12 even though soil has been disturbed as observed by the dark soil layer (12-20") below the gley layer (6-12")

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): 1-2"

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No water was observed in the soil pit after 10 minutes, however surface water ponding was obversed within 15 feet of the sample plot.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: NASWI P8A City/County: Island County Sampling Date: 2/1/2013

Applicant/Owner: US Navy/NAS Whidbey Island State: WA Sampling Point: WD3-WP2

Investigator(s): C. Fisher & B. Mackey Section, Township, Range: S23, T33N, R1E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR): LRR A Lat: ______ Long: ______ Datum: NAD 83

Soil Map Unit Name: Sholander, Cool-Spieden Complex, 0-5% Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks: WP2 is the wetland paired pit of UP2 along the northern boundary of WD3. This boundary was delineated based on a slight change in topography of 1 to 3 feet, a gradual shift in vegetation, and surface ponding.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1. None			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1. None			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ___)			
1. Poa spp./Agrastis spp.	75	Y	FAC
2. Tuners sp.	25	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ___)			
1. None			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ___			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	25	x 2 = 50
FAC species	75	x 3 = 225
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	100 (A)	275 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: Due to winter delineation, herbaceous vegetation was not possible to identify to species and very difficult to identify to genus.

SOIL

Sampling Point: WD3-WP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					Silty Clay	Loam
10-20	10Y 5/1	90	10YR 5/8	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ______

Remarks:

Soil meets indicator A11.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ✓ No ______ Depth (inches): 1-2"

Water Table Present? Yes ✓ No ______ Depth (inches): 5"

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 0"

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water ponding observed within 20 feet of soil pit. Water observed in pit at 5 inches below ground surface after 10 minutes.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: NASWI P-8A City/County: Island County Sampling Date: 2/1/2013

Applicant/Owner: US Navy/NAS Whidbey Island State: WA Sampling Point: WD3-WP3

Investigator(s): C. Fisher & B. Mackey Section, Township, Range: S23, T33N, R1E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR): LRR A Lat: ____ Long: ____ Datum: NAD 83

Soil Map Unit Name: Sholander, Cool-Spieden Complex, 0-5% Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? Yes ✓ No ___

Remarks: This extension of WD3 is located on the west side of the gravel road. Wetland is highly manipulated and disturbed and hydrologically influenced by stormwater and groundwater flow. Area bordered to the south by Torpedo Rd., to the east by a gravel road, to the west by the large stormwater ditch, and paired pits were collected at the northern upland boundary.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1. None			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1. None			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ___)			
1. Juncus sp.	50	Y	FACW
2. Poa spp./Agrastis spp.	50	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ___)			
1. None			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		250 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: Due to winter delineation, herbaceous vegetation was not possible to identify to species and very difficult to identify to genus.

SOIL

Sampling Point: WD3-WP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-20	10 YR 3/1	100					Silty clay	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ______ **No** ✓

Remarks:

Soil does not meet hydric soil indicators, however soil was saturated so redox features may not have been visible. In addition, this area has been disturbed (historic soil disturbance) and may indicate a disturbed soil profile (lacking the typical gleyed layer).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ✓ No ______ Depth (inches): 1-2"

Water Table Present? Yes ✓ No ______ Depth (inches): 7"

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 0"

Wetland Hydrology Present? **Yes** ✓ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water observed at 7" below ground surface within 5 minutes. Surface water ponding observed within 5 feet of sample point.

Appendix B

Washington Department of Ecology
Western Washington Wetland Ratings Form

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Wetland name or number D-3

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): D-3 Date of site visit: ____

Rated by C. Bloc & B. MacKay Trained by Ecology? Yes ✓ No___ Date of training 10/2008

SEC: 23 TWNSHP: 33N RNGE: 1E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ____ Estimated size 4.64ac

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III ✓ IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	12
Score for Hydrologic Functions	14
Score for Habitat Functions	7
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category **(choose the "highest" category from above)** N/A

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	✓
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Wetland name or number D-3

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number D-3

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** **NO – Saltwater Tidal Fringe (Estuarine)**

If your wetland can be classified as a Freshwater Tidal Fringe use the forms for ***Riverine*** *wetlands. If it is Saltwater Tidal Fringe it is rated as an* ***Estuarine*** *wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
NO – go to 4 **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO - go to 5 **YES** – The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

NO - go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 YES – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 YES – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number D-3

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	*(see p.38)*
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* Provide photo or drawing	Figure ___ 1
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure ___ 5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	Figure ___ 0
D	**Total for D 1** *Add the points in the boxes above*	6
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland ✓ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ✓ Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other ___ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	12

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* points = 0	1
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	3
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	7
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ✓ Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other ______________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 49)* multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 *Add score to table on p. 1*	14

R	Riverine and Freshwater Tidal Fringe Wetlands WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	Points (only 1 score per box)
R	**R 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	*(see p.52)*
R	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland — points = 8 Depressions cover > 1/2 area of wetland — points = 4 If depressions > ½ of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/2 area of wetland — points = 2 No depressions present — points = 0	Figure ___
R	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): Trees or shrubs > 2/3 the area of the unit — points = 8 Trees or shrubs > 1/3 area of the unit — points = 6 Ungrazed, herbaceous plants > 2/3 area of unit — points = 6 Ungrazed herbaceous plants > 1/3 area of unit — points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit — points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___
R	*Add the points in the boxes above*	
R	**R 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 feet of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality — Other ______________________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.53)* multiplier _____
R	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from R 1 by R 2 ***Add score to table on p. 1***	

Comments

R	**Riverine and Freshwater Tidal Fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	R 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	*(see p.54)*
R	R 3.1 Characteristics of the overbank storage the unit provides: *Estimate the average width of the wetland unit perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit)/(average width of stream between banks).* If the ratio is more than 20 points = 9 If the ratio is between 10 – 20 points = 6 If the ratio is 5 - <10 points = 4 If the ratio is 1 - <5 points = 2 If the ratio is < 1 points = 1 Aerial photo or map showing average widths	Figure ___
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description.* (polygons need to have >90% cover at person height NOT Cowardin classes): Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area points = 7 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area points = 4 Vegetation does not meet above criteria points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___
R	*Add the points in the boxes above*	
R	**R 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* — There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. — There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding — Other______________________ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.57)* multiplier ______
R	**TOTAL - Hydrologic Functions** Multiply the score from R 3 by R 4 ***Add score to table on p. 1***	

Comments

L	**Lake-fringe Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
L	**L 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	*(see p.59)*
L	L 1.1 Average width of vegetation along the lakeshore *(use polygons of Cowardin classes)*: Vegetation is more than 33ft (10m) wide — points = 6 Vegetation is more than 16 (5m) wide and <33ft — points = 3 Vegetation is more than 6ft (2m) wide and <16 ft — points = 1 Vegetation is less than 6 ft wide — points = 0 Map of Cowardin classes with widths marked	Figure ___
L	L 1.2 Characteristics of the vegetation in the wetland: *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Cover of herbaceous plants is >90% of the vegetated area — points = 6 Cover of herbaceous plants is >2/3 of the vegetated area — points = 4 Cover of herbaceous plants is >1/3 of the vegetated area — points = 3 Other vegetation that is not aquatic bed or herbaceous covers > 2/3 unit — points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area — points = 1 Aquatic bed vegetation and open water cover > 2/3 of the unit — points = 0 Map with polygons of different vegetation types	Figure ___
L	*Add the points in the boxes above*	
L	**L 2. Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Polluted water discharges to wetland along upland edge — Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) — Power boats with gasoline or diesel engines use the lake — Other ______________________________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.61)* multiplier ______
L	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from L1 by L2 ***Add score to table on p. 1***	

Comments

L	**Lake-fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce shoreline erosion	**Points** (only 1 score per box)
L	**L 3. Does the wetland unit have the <u>potential</u> to reduce shoreline erosion?**	*(see p.62)*
L	L 3 Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* > ¾ of distance is shrubs or forest at least 33 ft (10m) wide — points = 6 > ¾ of distance is shrubs or forest at least 6 ft. (2 m) wide — points = 4 > ¼ distance is shrubs or forest at least 33 ft (10m) wide — points = 4 Vegetation is at least 6 ft (2m) wide (any type except aquatic bed) — points = 2 Vegetation is less than 6 ft (2m) wide (any type except aquatic bed) — points = 0 Aerial photo or map with Cowardin vegetation classes	Figure ___
L	*Record the points from the box above*	
L	**L 4. Does the wetland unit have the <u>opportunity</u> to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* — There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests other wetlands) than can be damaged by shoreline erosion — Other ______________________ **YES** multiplier is **2** **NO** multiplier is **1**	multiplier
L	**TOTAL - Hydrologic Functions** Multiply the score from L 3 by L 4 ***Add score to table on p. 1***	

Comments

S	Slope Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	*(see p.64)*
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ___
S	**Total for S 1** *Add the points in the boxes above*	
S	**S 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other____________________ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.67)* multiplier _____
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	

Comments

Wetland name or number ______

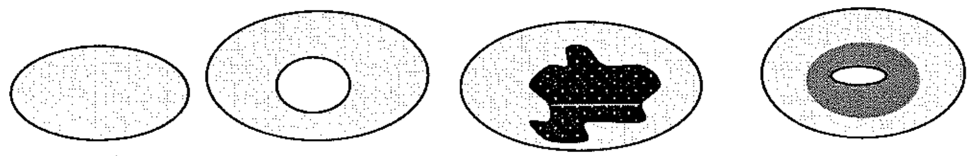
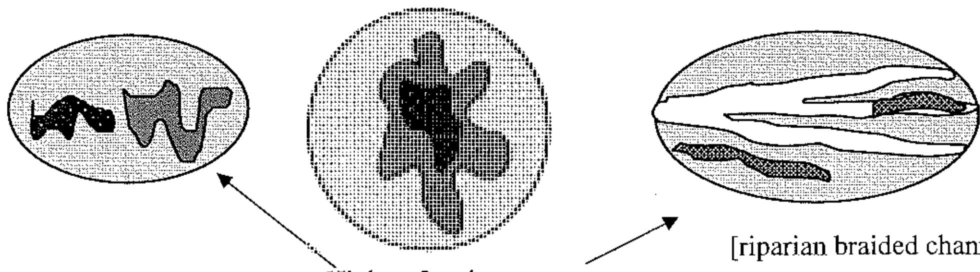
S	Slope Wetlands HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	Points (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	*(see p.68)*
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	
S	*Add the points in the boxes above*	
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other________________________________ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 70)* multiplier ______
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	

Comments

Wetland name or number D-3

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Vegetation structure *(see p. 72)* *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed ✓ Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 Map of Cowardin vegetation classes 3 structures points = 2 2 structures points = 1 1 structure points = 0	Figure ___ 0
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated 4 or more types present points = 3 ✓ Seasonally flooded or inundated 3 types present points = 2 ✓ Occasionally flooded or inundated 2 types present point = 1 ✓ Saturated only 1 type present points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 2
H 1.3. Richness of Plant Species *(see p. 75)* Count the number of plant species in the wetland that cover at least 10 ft^2. *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	0

Total for page 2

<table>
<tr>
<td>
H 1.4. <u>Interspersion of habitats</u> (see p. 76)
Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.

None = 0 points   Low = 1 point   Moderate = 2 points

[riparian braided channels]
High = 3 points
NOTE: If you have four or more classes or three vegetation classes and open water the rating is always “high”. Use map of Cowardin vegetation classes
</td>
<td>Figure ___

1</td>
</tr>
<tr>
<td>
H 1.5. <u>Special Habitat Features:</u> (see p. 77)
Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.
____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
____Standing snags (diameter at the bottom > 4 inches) in the wetland
____Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
____Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
____At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (structures for egg-laying by amphibians)
____ Invasive plants cover less than 25% of the wetland area in each stratum of plants
NOTE: The 20% stated in early printings of the manual on page 78 is an error.
</td>
<td>0</td>
</tr>
<tr>
<td>H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5</td>
<td>3</td>
</tr>
</table>

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?

H 2.1 Buffers *(see p. 80)* — Figure ___

Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."

- 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5**
- 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4**
- 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**
- 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3**
- 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3**

If buffer does not meet any of the criteria above

- No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**
- No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**
- Heavy grazing in buffer. **Points = 1**
- ✓ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.**
- Buffer does not meet any of the criteria above. **Points = 1**

Aerial photo showing buffers

0

H 2.2 Corridors and Connections *(see p. 81)*

H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*).

YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2

H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above?

YES = **2 points** (*go to H 2.3*) NO = H 2.2.3

H 2.2.3 Is the wetland:

within 5 mi (8km) of a brackish or salt water estuary OR
within 3 mi of a large field or pasture (>40 acres) OR
within 1 mi of a lake greater than 20 acres?

YES = **1 point** NO = **0 points**

1

Total for page 1

H 2.3 <u>Near or adjacent to other priority habitats listed by WDFW</u> ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres). ____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____**Old-growth forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ____**Prairies:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages ____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%. ____**Urban Natural Open Space**: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development. ____**Estuary/Estuary-like:** Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons. ____**Marine/Estuarine Shorelines**: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control). If wetland has **3 or more** priority habitats = **4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	0

Wetland name or number D-3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	4
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	7

Wetland name or number D-3

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES = Category I NO go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number ______

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ___ or accessed from WNHP/DNR web site ___ YES_____ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ✓ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category 1 NO ✓ not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes – Is a bog for purpose of rating No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No ✓ Is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES = Go to SC 5.1 NO ✓ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

SC 6.0 Interdunal Wetlands *(see p. 93)*	
Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109	
SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II NO – go to SC 6.2	**Cat. II**
SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	N/A.

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Conceptual Wetland Mitigation Plan for Naval Air Station Whidbey Island Island County, Washington

Draft Report

August 2013

DEPARTMENT OF THE NAVY

Prepared By:
ecology and environment, inc.
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EXECUTIVE SUMMARY

This conceptual wetland mitigation plan presents an overview of compensatory mitigation measures for wetland impacts from proposed infrastructure and support facility development at Naval Air Station (NAS) Whidbey Island, Island County, Washington.

The Navy is currently preparing a Supplemental Environmental Impact Statement (SEIS) to evaluate changes to the home basing alternatives and analysis contained in the *Final Environmental Impact Statement (EIS) for Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet,* published in 2008. The SEIS will assess the potential environmental effects of home basing P-8A aircraft and the related changes in aircraft operations and personnel, facility modifications, and construction requirements at both NAS Whidbey Island and NAS Jacksonville, Florida.

The action was needed and continues to allow the Navy to efficiently and effectively retire aging P-3C aircraft and transition P-8A aircraft into the fleet while maintaining a maritime patrol capability that sustains national defense objectives and policies. Dual-site home basing could provide potential cost savings while reducing redundancies and still meeting current strategic operational objectives.

The SEIS analyzes the environmental impacts associated with home basing aircraft at two rather than three locations. Two action alternatives that include home basing squadrons at NAS Whidbey Island plus the No Action Alternative are being analyzed.

Alternative 1. Alternative 1 considers the environmental effects of home basing six P-8A fleet squadrons at NAS Whidbey Island.

Alternative 2. Alternative 2 considers the environmental effects of home basing seven P-8A squadrons at NAS Whidbey Island.

No Action Alternative. The No Action Alternative represents current conditions in April 2014 to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 Record of Decision (ROD) were to occur. At NAS Whidbey Island, facilities and functions would continue to support P-3C operations as the P-8A transition has not begun at this location.

Home basing of the P-8A at NAS Whidbey Island would utilize existing infrastructure to the maximum extent practicable to facilitate a quick and efficient transition while maintaining combat readiness. However, part of the implementation of the P-8A home basing would require new construction of associated infrastructure and support facilities. Under both Alternatives 1 and 2, the proposed action would affect current conditions specifically related to natural resources, particularly wetlands, at NAS Whidbey Island (Ault Field).

A jurisdictional delineation of the project area at Ault Field was performed by ecologists from Ecology and Environment, Inc. (E & E), on February 1, 2013. A wetland, WD-3, totaling 4.54 acres was identified, delineated, and then rated in accordance with the Washington State Wetland Rating System for Western Washington. This wetland was rated as a Depressional Category III wetland. An additional 0.8 acre of wetland, WS-1, within a stormwater drainage ditch, was identified by the U.S. Army Corp of Engineers (USACE) on May 9, 2013. WS-1 is

hydrologically connected to WD-3 and is considered part of the Depressional Category III wetland.

If Alternative 1 is selected, the proposed parking apron expansion would permanently impact approximately 0.8 acre of Wetland WS-1. If Alternative 2 is selected, the proposed parking apron expansion would permanently impact approximately 2.44 acres of wetland, including 0.8 acre of WS-1 and 1.64 acres of WD-3.

The stormwater drainage ditch, which contains jurisdictional Wetland WS-1, surrounds the tarmac at Hangar 9 and is a channelized portion of the original drainage that flows through Clover Valley, connecting NAS Whidbey Island to Dugualla Bay. This ditch conveys both stormwater runoff from the tarmac and spring-fed water originating from several nearby wetland complexes and has a semi-permanent to permanent annual flow. This ditch is considered Waters of the U.S. Impacts to Wetland WS-1 would be mitigated at the offsite location described below, while stormwater from the proposed construction would be routed through a new stormwater drainage ditch. Under either Alternative 1 or 2, approximately 950 linear feet of this ditch will be re-routed around the proposed parking apron footprint. A new 1,550-linear-foot ditch would be created around the apron under Alternative 1, and approximately 1,600 linear feet of ditch would be created under Alternative 2.

In 2007, during a pre-application meeting with the regulatory agencies, the Navy presented to USACE and the Washington Department of Ecology a series of locations as potential mitigation areas to offset the impacts to wetlands proposed at that time (Navy 2007). It was agreed upon by the USACE, Ecology, and the Navy that the Crescent Harbor mitigation area at NAS Whidbey Island (Seaplane Base), north of Crescent Harbor, was best suited to mitigate the impact from the proposed infrastructure development at Ault Field.

Based on the 2007 agreement, the Navy has identified an 85-acre area of the Crescent Harbor mitigation area for mitigation to offset impacts from the proposed construction in the wetland under both action alternatives. Two alternative areas were identified as suitable for mitigation on this Navy-owned land; each area has a sustainable source of natural water, and each area is close to either other wetlands or undisturbed areas and/or connects to those habitats that are relatively undisturbed. Furthermore, each site also has adjacent upland or other habitats that can provide a buffer of sufficient width to protect the wetland.

The goal of the final mitigation plan will be to compensate for the filling of the approximately 0.8 acre under Alternative 1 and 2.44 acres under Alternative 2 of Depressional Category III wetland and increase the net wetland functions and values at a landscape level through either rehabilitation or enhancement of existing wetlands

The mitigation presented in this conceptual mitigation plan was developed using *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Washington State Department of Ecology [Ecology] et al. 2006) and the *Washington State Wetland Rating System for Western Washington* (Ecology 2004). Per these guidelines, the Navy proposes to mitigate the wetland impacts at either a ratio of 4:1 for wetland rehabilitation or at a ratio of 8:1 for wetland enhancement at the Crescent Harbor mitigation area. This would result in rehabilitation of 3.2 acres of wetlands under Alternative 1 or 6.5 acres under Alternative 2, or enhancement of 6.5 acres of wetland under Alternative 1 or 13 acres under Alternative 2.

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LIST OF ACRONYMS AND ABBRIVIATIONS

°F	degrees Fahrenheit
E & E	Ecology and Environment, Inc.
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FR	Federal Register
FRS	Fleet Replacement Squadron
msl	mean sea level
NAS	Naval Air Station
NRCS	Natural Resource Conservation Service
Navy	Department of the Navy
ROD	Record of Decision
SEIS	Supplemental Environmental Impact Statement
USACE	U.S. Army Corps of Engineers

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1.0 INTRODUCTION

1.1 Proposal and Purpose

In November 2008, the Department of the Navy (Navy) completed the *Final Environmental Impact Statement (FEIS) for the Introduction of the P-8A Multi-Mission Aircraft into the U.S. Navy Fleet*, which evaluated the environmental impacts of home basing 12 P-8A fleet squadrons (72 aircraft) and one Fleet Replacement Squadron (FRS) (12 aircraft) at established maritime patrol home bases (Navy 2008). The Assistant Secretary of the Navy for Energy, Installations, and Environment reviewed the FEIS, and after carefully weighing the operational, social, and environmental impacts of the proposed action, determined the Navy would home base five fleet squadrons and the FRS at Naval Air Station (NAS) Jacksonville, Florida; four fleet squadrons at NAS Whidbey Island, Washington; and three fleet squadrons at Marine Corps Base (MCB) Hawaii Kaneohe Bay, Hawaii, with periodic squadron detachments at Naval Base Coronado, California (Alternative 5). A notice of the Record of Decision (ROD) was published in the Federal Register (FR) on January 2, 2009 (74 FR 100).

The action was needed and continues to allow the Navy to efficiently and effectively retire aging P-3C aircraft and transition P-8A aircraft into the fleet while maintaining a maritime patrol capability that sustains national defense objectives and policies. Dual-site home basing could provide potential cost savings while reducing redundancies and still meeting current strategic operational objectives. Accordingly, the Navy is preparing a Supplemental EIS (SEIS) to analyze the environmental impacts associated with home basing aircraft at two rather than three locations. Two action alternatives that include home basing squadrons at NAS Whidbey Island plus the No Action Alternative are being analyzed.

NAS Whidbey Island has been identified as one of two of the proposed home bases for P-8A aircraft, along with NAS Jacksonville. The following two action alternatives, which include home basing squadrons at NAS Whidbey Island, plus the No Action Alternative, are being analyzed.

Alternative 1. Alternative 1 considers the environmental effects of home basing six P-8A fleet squadrons at NAS Whidbey Island.

Alternative 2. Alternative 2 considers the environmental effects of home basing seven P-8A squadrons at NAS Whidbey Island.

No Action Alternative. The No Action Alternative represents current conditions in April 2014 to be used as a baseline of comparison against which environmental consequences can be measured. The No Action Alternative describes the conditions if no further implementation of the 2008 ROD were to occur. At NAS Whidbey, facilities and functions would continue to support P-3C operations as the P-8A transition has not begun at this location.

Alternatives 1 and 2 would require facility renovation and construction at NAS Whidbey Island. These alternatives would require the demolition and expansion of several existing buildings within the airfield. In addition, Alternatives 1 and 2 would require expansion of the existing aircraft parking ramp and paving of additional upland area for aircraft parking. An approximately 400,000 square feet (sq. ft.) expansion would be required for Alternative 1 to park aircraft associated with six squadrons, while a 660,000 sq. ft. expansion would be required for Alternative 2 to park aircraft associated with seven squadrons. Expansion of the apron would require demolition of five buildings at the airfield. This expansion would also require relocation of the existing aircraft rinse facility, relocation of the existing liquid oxygen and sonobuoy storage facilities, and construction of new vehicle parking (8,810 sq. ft.) on the west side of Charles Porter Avenue to support the additional squadron personnel.

Alternative 2 would require construction of a new two-bay P-8A hangar bay adjacent to Hangar 6 to house two additional P-8A aircraft. This hangar would be constructed on existing impervious surface. Construction of the new hangar would not be required under Alternative 1.

A project area was identified by the Navy during development of plans for the infrastructure and support facilities associated with the proposed action. A jurisdictional delineation of this project area was performed by ecologists from Ecology and Environment, Inc. (E & E), on February 1, 2013 (Navy 2013). This survey identified one wetland (Wetland WD-3), totaling 4.54 acres. Wetland WD-3 would not be impacted by any of the construction projects proposed under Alternative 1 but would be impacted under Alternative 2 as a result of the proposed parking apron expansion. The total acreage of Wetland WD-3 that would be permanently impacted under Alternative 2 is approximately 1.64 acres.

A stormwater drainage ditch surrounding the tarmac at Hangar 9 is a channelized portion of the original drainage that flows through Clover Valley. This ditch conveys both stormwater runoff from the tarmac and spring-fed water originating from several nearby wetland complexes and has a semi-permanent to permanent annual flow. A portion of this drainage ditch was identified as wetland by the U.S. Army Corp of Engineers (USACE) during a site visit on May 9, 2013. This wetland is called Wetland WS-1.

Approximately 0.8 acre of Wetland WS-1 would be impacted under both alternatives. Under both alternatives, approximately 950 linear feet of this ditch would be re-routed around the new apron footprints. A new 1,550-linear-foot ditch would be created around the apron under Alternative 1, and approximately 1,600 linear feet of ditch would be created under Alternative 2.

The purpose of this conceptual wetland mitigation plan is to discuss mitigation options for the wetland impacts associated with construction of the parking apron expansion under Alternatives 1 and 2. The alternative mitigation opportunities presented in this analysis were developed using *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Washington State Department of Ecology [Ecology] et al. 2006) and the *Washington State Wetland Rating System for Western Washington* (Ecology 2004).

The goal of the final mitigation plan will be to compensate for the wetland impacts under the preferred alternative and increase the net wetland functions and values at a landscape level, either through wetland creation or enhancement of existing wetlands. Under Alternative 1, 0.8 acre of wetland would be impacted, consisting entirely of Wetland WS-1. Under Alternative 2, approximately 2.44 acres of wetland would be impacted, including 1.64 acres of Wetland WD-3 and 0.8 acre of Wetland WS-1.

1.2 Project Area Description

The project area at NAS Whidbey Island is located to the south of the airstrip at Ault Field, in a portion of Section 23 in Township 33 North, Range 1 East (Figure 1-2; U.S. Geologic Survey 1973; Navy 2013).

Commissioned in 1942, NAS Whidbey Island is approximately 30 miles north of Seattle, located at the north end of Whidbey Island adjacent to the community of Oak Harbor (Figure 1-1). NAS

Whidbey Island consists of four distinct parcels: Ault Field, Seaplane Base, Outlying Landing Field Coupeville, and Lake Hancock.

The general terrain of Ault Field is relatively flat and approximately 15 feet above mean sea level (msl). Whidbey Island's location at the east end of the Strait of Juan de Fuca routinely exposes it to relatively cool, marine air passing eastward through the strait. As this portion of Whidbey Island is situated in the rain shadow of the Olympic Mountains, precipitation averages between 18 and 20 inches per year (Ness 1958; Ecology et al. 2006). Temperatures are generally moderate, with mean summer highs in the mid-70s Fahrenheit (^{o}F) and mean winter lows in the mid-30s^{o}F (Weather.com 2013).

The soils of Island County originated largely from glacial drift consisting of sand, gravel, and some clay (Ness 1958). In places, the soil is mixed with stones and boulders, some more than a foot in diameter. This drift was deposited in moraines left by glaciers that once moved over the Puget Sound area from the north. Locally, the drift is stratified.

1.2.1 Proposed Mitigation Area at Crescent Harbor (Seaplane Base)

The proposed mitigation area is on the NAS Whidbey Island Seaplane Base parcel, immediately east of Oak Harbor (Figure 1-3). The mitigation area faces south and has low topographic relief. The northern boundary of the mitigation area abuts Crescent Harbor Road, and its central section is bounded on the north by a Navy housing development. The western boundary of the mitigation area is approximately 590 feet west of Crescent Ditch and extends south from Crescent Harbor Road through the middle of a mowed field. The southern portion of the study area is bounded by Pioneer Road.

The proposed mitigation area is located in a portion of Section 39 in Township 33 North, Range 1 East (U.S. Geologic Survey 1977).

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Source: ESRI, Delorme, NAVTEQ, USGS 2012;
NAVFAC GeoRediness Center, 2006; NAS Whidbey Island, 2013.

Figure 1-1
Project Vicinity Map - NAS Whidbey Island
Whidbey Island, Washington

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M:\VA_Beach\MMA\2013\Maps\MXD\Reports\Conceptual_Mitigation_Plan\impact_area.mxd 8/2/2013

Source: ESRI, 2011; USGS Topo 1981; Ecology & Environment Inc. 2013; NAS Whidbey Island 2013.

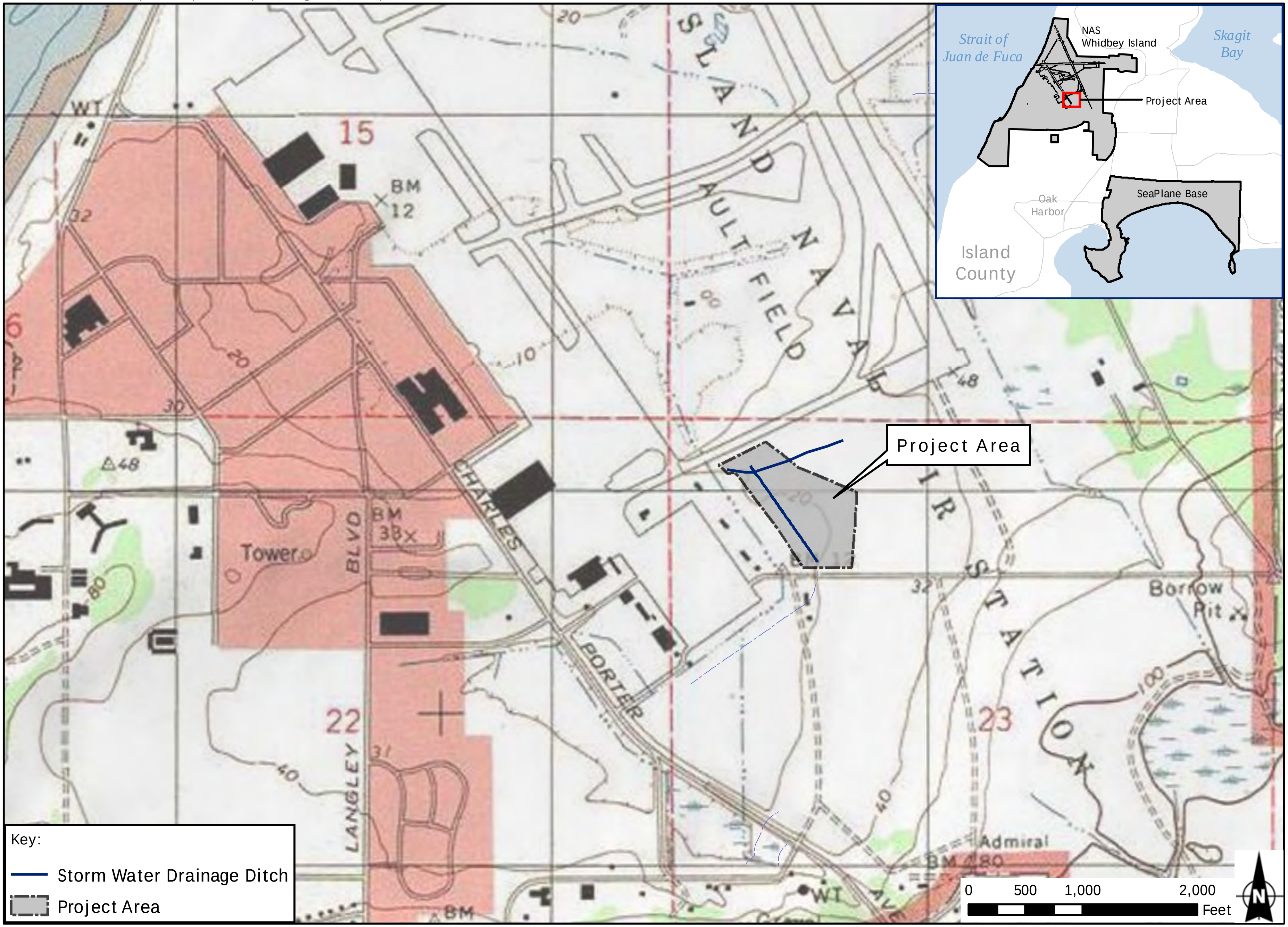

Figure 1-2
Project Area at NAS Whidbey Island (Ault Field)
NAS Whidbey Island, Island County, Washington

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Source: ESRI, 2011; USGS Topo 1981; Ecology & Environment Inc. 2013; NAS Whidbey Island 2013.

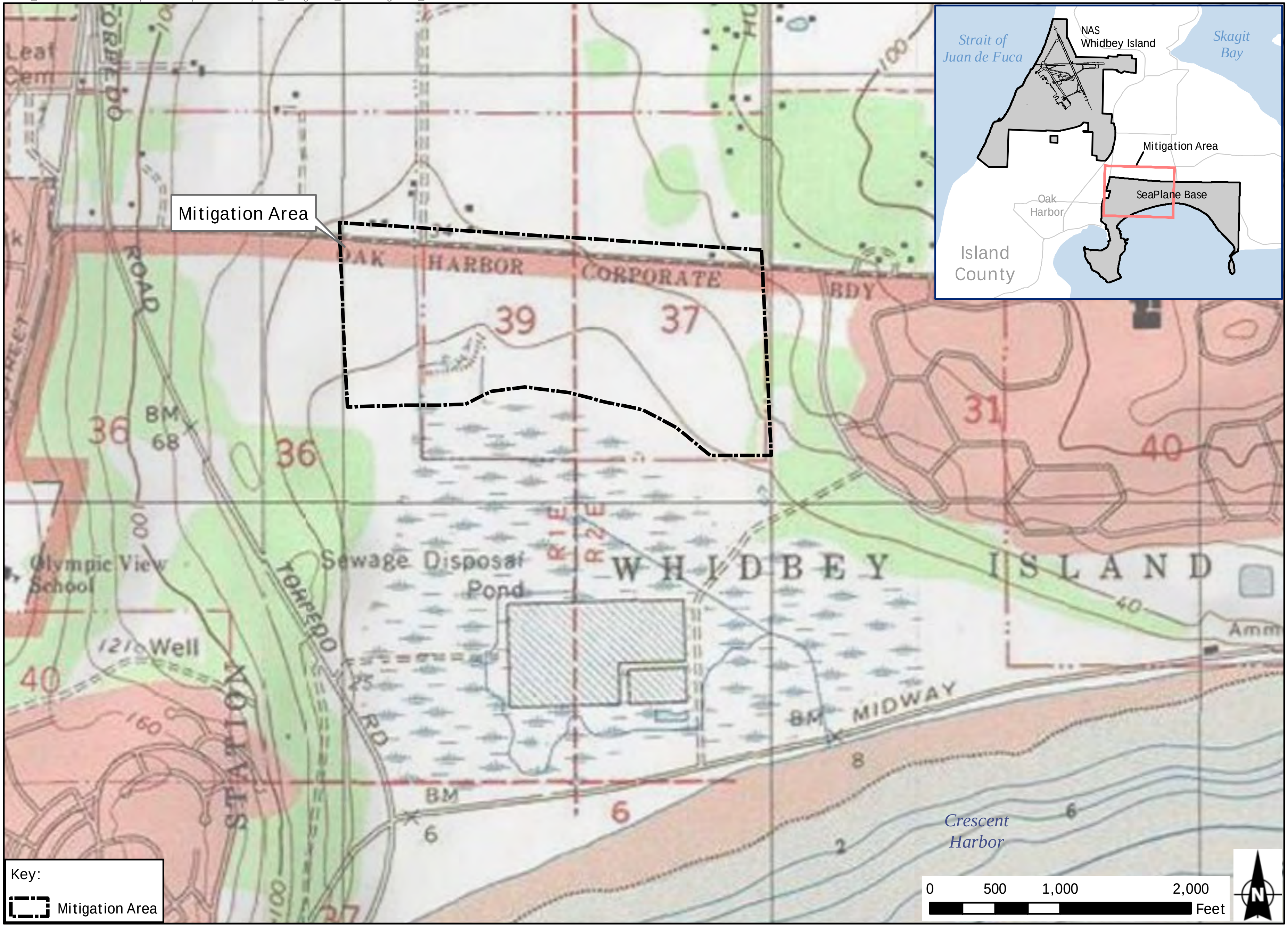

Figure 1-3
Location of Proposed Wetland Mitigation Area at NAS Whidbey Island (Seaplane Base)
NAS Whidbey Island, Island County, Washington

2.0 PROPOSED IMPACT AND MITIGATION AREAS

The proposed apron expansion area under Alternative 1 would permanently impact approximately 0.8 acre of Wetland WS-1, and Alternative 2 would permanently impact approximately 2.44 acres of Wetland WD-3 and WS-1 at NAS Whidbey Island's Ault Field (Figures 2-1 and 2-2).

The proposed mitigation would provide compensatory mitigation offsite for this wetland impact. The wetlands that will be permanently impacted are under the jurisdiction of USACE and Ecology.

2.1 Proposed Impact Area at Ault Field

A full description of the wetlands delineated in the project area is provided in the *Naval Air Station Whidbey Island Final Wetland Delineation Report* (Navy 2013). Below is a summary of the findings of that report.

An approximately 16-acre project area was surveyed at NAS Whidbey Island's Ault Field, of which approximately 4.54 acres contained wetland habitat (Figure 2-1). Wetland WD-3 is located east of the airfield facilities, north of Aries Road. In addition, a total of approximately 1,400 linear feet of artificial drainage ditch, 950 linear feet of which contains wetlands, occurs in the impact area and conveys stormwater and spring water along Clover Valley Stream to Dugualla Lagoon for discharge (via a pump system) into Dugualla Bay.

Wetland WD-3 was classified as a Palustrine System because it was dominated by persistent emergent vegetation, was less than 20 acres, did not have wave-formed or bedrock shoreline features, and had a water depth of less than 6.6 feet. Soils within the wetland are a Sholander, cool-Spieden complex, with 0 to 5 percent slopes (see Appendix B; Natural Resource Conservation Service [NRCS] 2013). The wetland was categorized in one hydrogeomorphic type: Depressional (Ecology 2004).

According to the revised Washington State Wetland Rating System, WD-3 was rated as a Category III wetland, with relatively low to moderate quality habitat in terms of its potential to improve water quality and provide diverse fish and wildlife habitat and opportunities to reduce flooding.

In addition to the delineation of Wetland WD-3 completed by E&E for the Navy, a portion of the artificial drainage ditch surrounding the tarmac at Hangar 9 was identified as wetland by USACE during a site visit on May 9, 2013. This wetland, Wetland WS-1, is hydrologically connected to WD-3 and is considered part of the Depressional Category III wetland. Wetland WS-1 soils are also a Sholander, cool-Spieden complex, with 0 to 5 percent slopes (see Appendix B).

2.2 Proposed Mitigation Area at Crescent Harbor

In 2007, during a pre-application meeting with the regulatory agencies, the Navy presented to USACE and Ecology a series of locations as potential mitigation areas to offset the impacts to wetlands proposed at that time (Navy 2007). It was agreed upon by the USACE, Ecology, and the Navy that the Crescent Harbor mitigation area was best suited to mitigate the impact from the proposed infrastructure development at Ault Field. This site was selected based on criteria outlined in Appendix J (Site Selection Checklist) of *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Ecology et al. 2006; Appendix A).

The Crescent Harbor mitigation area is an 85-acre portion of an approximately 632-acre Navy-owned property (Figure 2-2). A preliminary jurisdictional wetland delineation of the 632-acre Navy-owned area identified 489 acres of jurisdictional waters of the United States and 143 acres of uplands in the area surrounding the Crescent Harbor mitigation area (Navy 2008). However, because of a long history of farming on this site, most of these wetlands had been severely altered. Grassland vegetation on the site is dominated by a combination of non-native wetland and upland pasture vegetation.

During the early 1900s, tidal inundation from Crescent Bay was restricted by a dike that ran parallel to Crescent Bay, channelizing the existing Crescent Bay Creek and draining the associated marsh to improve site conditions for agriculture. The remaining tidal marsh has severely muted tidal inundation through a flap-gate connection to Crescent Bay. The upstream reach of Crescent Bay Creek was modified through channelizing and deepening, filling in some locations, and creating hunting ponds and/or possible swimming areas through partial damming. In addition, disturbance likely has also occurred through channel incision as a result of upstream (offsite) anthropogenic impacts, such as agriculture and the construction of other drainage ditches, both onsite and upstream of the site. These disturbances significantly altered the natural hydrologic and geomorphic regime of the site.

The Navy entered into a partnership with Skagit Cooperative, made up of the Swinomish and the Sauk-Suiattle tribes, to restore 200 acres surrounding the City of Oak Harbor's 30-acre wastewater treatment plant, northwest of the inlet (Figure 2-2) and a saltwater marsh, through the Crescent Bay Salt Marsh and Salmon Restoration Plan. As part of this restoration plan, the lower portion of the Navy-owned property surrounding the Crescent Harbor mitigation area was re-opened to tidal exchange in 2009, and a bridge was constructed over the inlet location. This re-opening effort was intended to reestablish full tidal action to the lower portion of the site through construction of a new tidal channel inlet between the historically tidal portion of the site and Crescent Bay.

On the northwestern portion of the Navy-owned parcel surrounding the Crescent Harbor mitigation area is Crescent Creek, a channelized, non-fish-bearing, perennial stream that enters the site via a culvert under West Crescent Harbor Road. Once onsite, this stream flows downstream through a channelized ditch, discharging into an open area north of the wastewater treatment plant. General vegetation of the palustrine emergent wetland areas is dominated by grasses, with scrub-shrub areas dominated by Nootka rose (*Rosa nutkana*), snowberry (*Symphoricarpos albus*), and Himalayan blackberry (*Rubus armeniacus*).

To the west of the Navy-owned parcel surrounding the Crescent Harbor mitigation area is a forested area that separates the mitigation site from the NAS Whidbey Island Seaplane Base. The ridge and slope to the east are also forested, separating the mitigation site from existing Navy housing east of Forest Drive.

According to the Island County Soil Survey, the soil at the Crescent Harbor mitigation area includes Sholander, cool-Spieden complex (0 to 5 percent slopes); Coveland loam (0 to 5 percent slopes); Coupeville loam (0 to 3 percent slopes); and Semiahmoo muck (0 to 2 percent slopes) (see Appendix B; NRCS 2013).

2.2.1 Wetland Delineation of the Seaplane Base Area, including the Crescent Harbor Mitigation Area

In the fall of 2007, EDAW (now AECOM) completed a wetland delineation of the Crescent Harbor mitigation area. The company identified 489.3 acres of potential USACE jurisdictional wetland waters of the U.S. in its study area. EDAW mapped several wetland habitats in the study area, including estuarine emergent (67.5 acres), palustrine emergent (337.6 acres), palustrine scrub-shrub (55.0 acres), and palustrine forest (29.3 acres). Upland habitats in the study area included 130.4 acres distributed among upland grass (39.6 acres), upland shrub (15.5 acres), upland forest (61.6 acres), and disturbed/residential (13.66 acres).

2.3 Proposed Mitigation

The primary type of mitigation being proposed is "rehabilitation" of a degraded wetland, with "enhancement" of the riparian wetland area adjacent to the salt marsh as an alternative if rehabilitation is deemed not feasible by USACE and/or Ecology. Mitigation ratios follow those established in *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Washington State Department of Ecology 2006).

The overall mitigation acreage for rehabilitation is based on an approximately 4:1 mitigation ratio for permanent impacts to Category III wetlands, while enhancement is based on an approximately 8:1 mitigation ratio. Final mitigation ratios would be determined through discussions with USACE and Ecology during the final design and permitting phase of the proposed project.

Under Alternative 1, the approach for a conceptual wetland mitigation design at Crescent Harbor would include either rehabilitation of 3.2 acres of a palustrine, emergent wetland to the west of Crescent Creek or, if this approach is not feasible, enhancement of approximately 6.5 acres of palustrine, emergent wetland east of Crescent Creek as an alternative (Figure 1-3). Under Alternative 2, the Navy would rehabilitate 6.5 acres of the palustrine, emergent wetland to the west of Crescent Creek or 13 acres of palustrine, emergent wetland to the east.

The objective of rehabilitation would be to hydrologically connect either the 3.2- or 6.5-acre area to the salt marsh restoration project, creating one extensive landscape wetland system. The goal of enhancement would be to expand the current riparian vegetation along the northern edge of the salt marsh. Long-term benefits under both alternatives include enhancement of macroinvertebrate habitat while contributing to downstream nutrient production at the proposed salt marsh restoration site.

As part of rehabilitation, agricultural drainage ditches located in the margins of the mowed fields would be removed to restore local site hydrology in lower topographic positions. This would not require extensive soil excavation, but it may require the excavation of drainage tiles and filling of existing drainage ditches.

These ditches (approximately 1 foot wide by 1 foot deep) were probably constructed to drain surface and subsurface water on the site in order to use the land for agricultural purposes. "Disconnecting" these ditches would likely reduce the drainage of shallow groundwater and raise groundwater levels. In addition to restoring natural hydrology to this area, native wetland plant communities would be planted to reestablish the 6.5-acre rehabilitation site.

The area proposed for enhancement would likely require minor earth movement. The area would be planted with native vegetation to form a varied and structurally complex landscape onsite (e.g., plantings would include forest, scrub-shrub, and herbaceous vegetation).

2.3.1 Rationale for Site Selection

Selection of the Crescent Harbor mitigation area is based on the following factors:

- The property is currently owned by the Navy.
- The site is currently readily accessible for mitigation construction.
- The site is fenced, and public access is restricted.
- Filling existing drainage ditches would help to ensure hydrologic connectivity throughout the mitigation area.
- Rehabilitation/enhancing of wetlands in existing grass fields would add greater structural diversity to large areas of degraded wetlands and contribute to forested wetland functions in the future.
- With the restoration of the salt marsh to the south, rehabilitation of the mitigation area would support a higher habitat value and species diversity.
- The site is bounded by the salt marsh restoration and Crescent Harbor to the south; therefore, rehabilitation of either 3.2 or 6.5 acres of wetland (or enhancing either 6.5 or 13 acres) and hydrologically connecting them to the salt marsh would add to the overall net function and value of the wetlands in the watershed.
- Crescent Harbor and the salt marsh located downstream of the mitigation area were identified as important rearing habitat for juvenile salmon, including those federally listed under the Endangered Species Act.
- The topographic diversity and current conditions of the mitigation area allow for rehabilitating or enhancing a range of native plant communities and wetland habitat types, including forested wetlands.

The following discussion is based on a wetland delineation completed in 2007 (Navy 2008).

Ecological Setting in Relation to the Landscape/Watershed
The Navy's proposed action would impact wetland areas located at Ault Field. The Crescent Harbor mitigation area is not at Alt Field but located at the Seaplane Base, approximately 2.6 miles south of Ault Field. This offsite mitigation area is neither a geomorphologic setting similar to the impacted areas nor a similar ecological setting in relation to the larger landscape and the watershed. However, as discussed in Section 2.2, during a pre-application meeting in 2007 with the regulatory agencies, it was agreed upon by the USACE, Ecology, and the Navy that the Crescent Harbor mitigation area was best suited to mitigate the impact from the proposed infrastructure development at Ault Field. Upon completion of mitigation, the Crescent Harbor mitigation area ecological setting would be of higher value than the project area at Ault Field (Wetland WD-3). Therefore, the rehabilitation or enhancement of wetlands at the Crescent Harbor mitigation area would have a greater long-term positive function on the watershed.

Wetland Type and Location
The Crescent Harbor mitigation area would have similar surficial geology to that of the impact area at Ault Field. The general nature of the mitigation and impact areas are similar; however,

upon completion of mitigation, the Crescent Harbor mitigation area's functions and values would be higher than those of the impact area at Ault Field (Wetland WD-3).

Hydrologic Source

The hydrologic source of water for either the proposed restoration or enhancement mitigation areas is not seasonally restricted. The main hydrologic water source is a combination of precipitation, shallow groundwater levels, and a series of shallow drainage ditches (Navy 2008). Therefore, no measures would be needed to ensure a continuous onsite hydrologic water source because the existing water source is self-sustaining.

Wetland Rehabilitation/Restoration

The goal at the Crescent Harbor mitigation area would be to develop the area's functions and values to at least a Category II rating—significantly higher than the wetlands observed in the Ault Field impact area. The area identified for rehabilitation would be beneficial for wetland functions and habitat on a landscape level as well as watershed scale. In the northwest section of the mitigation area, the filling of agricultural drainage ditches would provide year-round hydrologic flow to the proposed 3.2- or 6.5-acre rehabilitation wetland. Because of the site's southern exposure, the rehabilitated wetland would be seeded with native grasses and planted with tree species that can tolerate full to partial sun.

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Source: ESRI, 2011; NAIP 2011; White Sheild Inc. 2013; Ecology & Environment Inc. 2013; NAS Whidbey Island 2013.

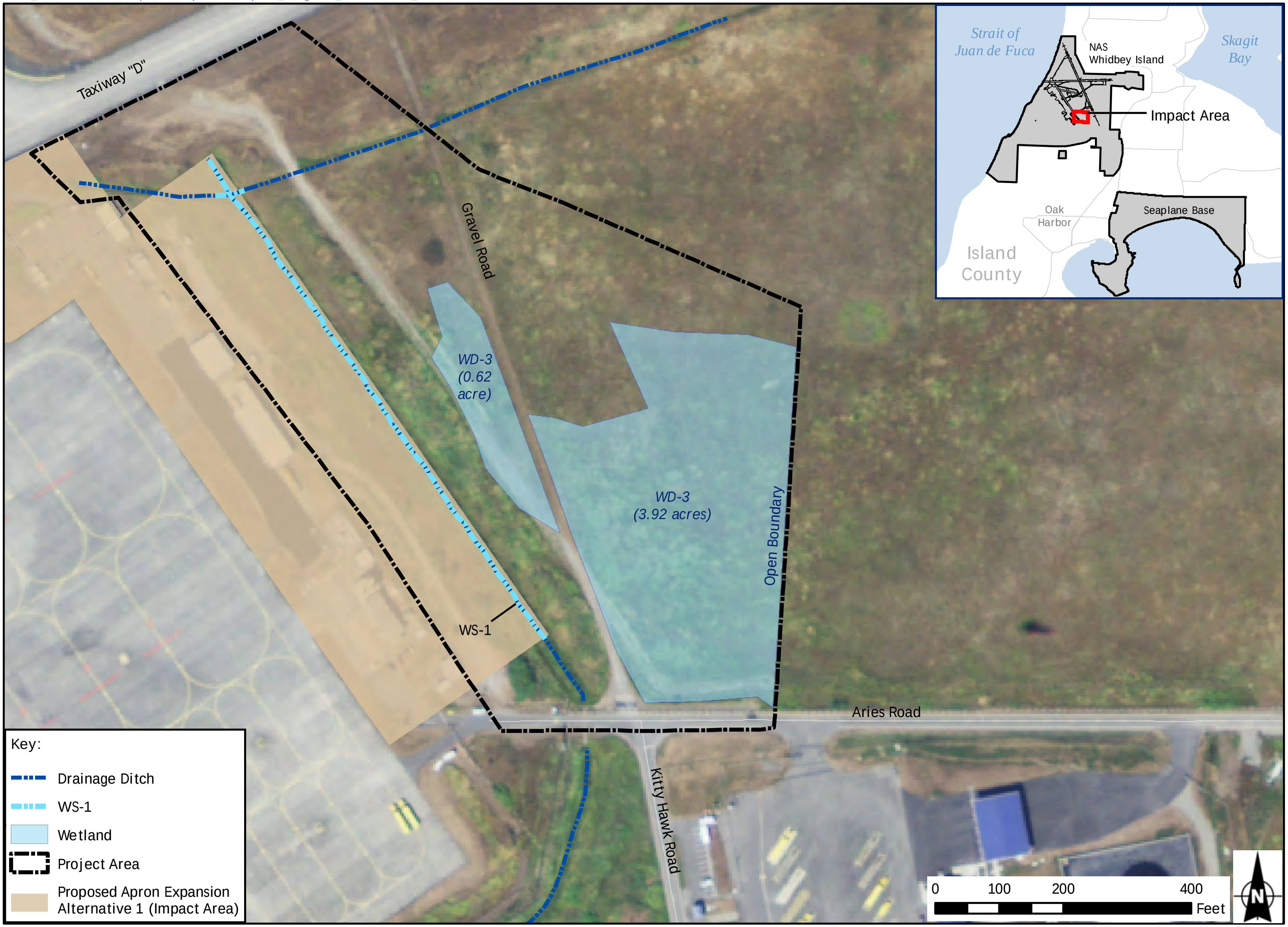

Figure 2-1
Location of Wetlands within the Alternative 1 Project Area
NAS Whidbey Island, Island County, Washington

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Source: ESRI, 2011; NAIP 2011; White Sheild Inc. 2013; Ecology & Environment Inc. 2013; NAS Whidbey Island 2013.

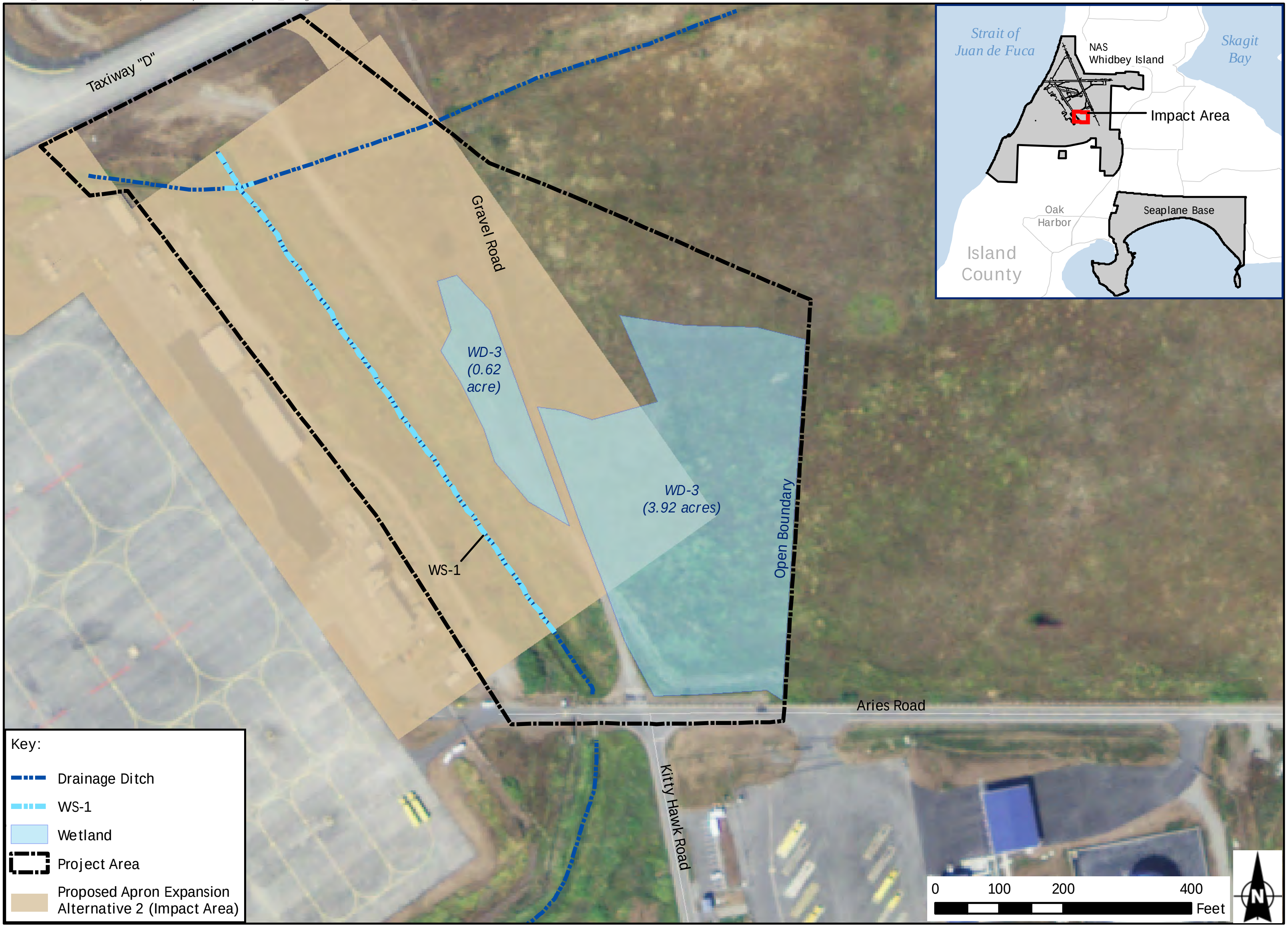

Figure 2-2
Location of Wetlands within the Alternative 2 Project Area
NAS Whidbey Island, Island County, Washington

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Source: ESRI, 2011; NAIP 2011; Ecology & Environment Inc. 2013; NAS Whidbey Island 2013.

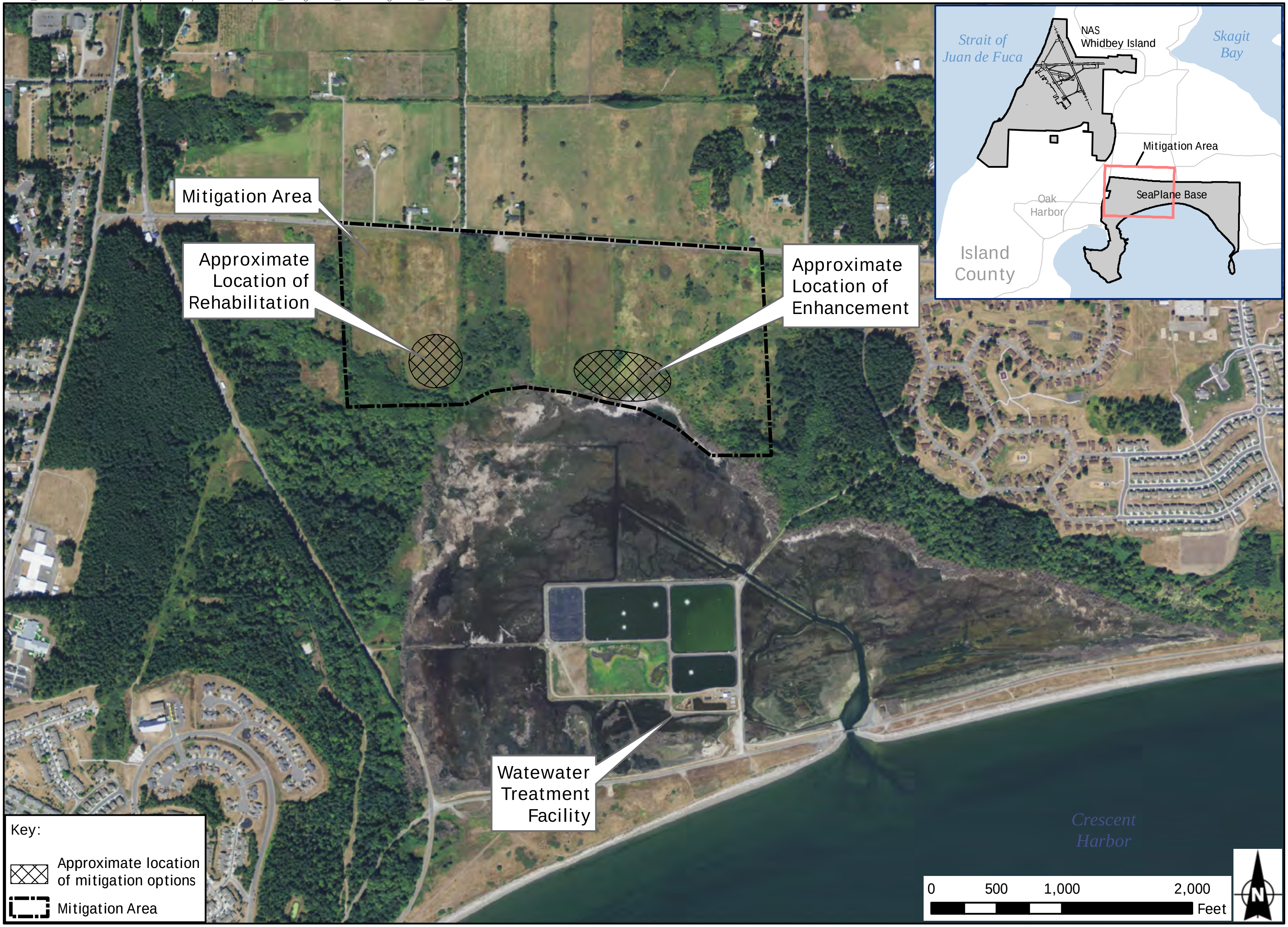

Figure 2-3
Location of Wetlands at NAS Whidbey Island (Seaplane Base)
NAS Whidbey Island, Island County, Washington

3.0 IMPLEMENTATION SCHEDULE

The Navy will submit a final mitigation plan to Ecology and USACE once the draft mitigation plan has been approved and a preferred alternative has been selected by the Navy. The final plan will include site design specifications, construction designs, and planting schedules. The anticipated task sequence and completion dates are presented in Table 3-1.

Table 3-1
Schedule for Mitigation Implementation and Selection of Design

Anticipated Steps for Implementation	Completion Date
Wetland Delineation Submittal Submit wetland delineation report to Ecology and USACE.	April 2013
Conceptual Mitigation Plan Submittal Submit conceptual wetland mitigation plan to Ecology and USACE.	Late Summer 2013
Pre-Application Meeting Discussions with Ecology, USACE, the Navy, and E & E to discuss impacts and mitigation options.	Late Summer/Early Fall 2013
Additional Site Visit(s) If necessary, further characterization of the final mitigation option may be necessary. This characterization could assess similar wetland/stream conditions in a nearby reference reach to assist in the development of suitable design criteria.	Late Summer/ Early Fall 2013
Formalizing Draft Wetland Mitigation Plan Submit draft drawings and calculations for the designs.	Mid-Winter 2013/2014
Design Phase Analysis Select suitable plant species based on site and development of design and planting specifications for the selected mitigation area.	Mid-Winter 2013/2014
Final Design	Mid-Spring 2014

3.1 General Design and Construction Schedule

- Obtain necessary permit approval from regulatory agencies by Spring 2014;
- Immediately begin civil survey and complete in 90 days (or sooner) of permit approval;
- If required, wetland reconnaissance mapping will identify wetland, wetland buffer, riparian, and upland areas within the mitigation area property;
- If required, excavation of the mitigation area will occur during summer 2014;
- Planting and seeding will occur in late fall 2014 and/or early spring 2015, as necessary;
- Fencing, gates, and signage will be installed in late fall 2014; and
- An as-built report will be submitted within 60 days of the construction and planting, and will provide the baseline data for the mitigation area. The report will include an as-built survey map of the mitigation area, locations of permanent reference points (transects and photographs), and the species and density of the final plantings.

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4.0 MITIGATION SITE MAINTENANCE

The site maintenance for the determined mitigation area will be dependent upon the mitigation scenario that is agreed to by the agencies and the Navy. If the trees and/or shrubs for any of the plantings do not show adequate vigor after the first growing season and it is determined they will benefit from the use of compost, compost would be applied at the beginning of the second growing season. To ensure preservation of the watershed, no slow-release fertilizers will be used.

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5.0 MONITORING AND CONTINGENCY PLAN

5.1 Post-Construction Monitoring

The Navy mitigation area will be monitored for 10 years to ensure successful revegetation and to observe surrounding developments to ensure the protection of the watershed. During the first three years, the mitigation area will be monitored once each quarter, and modifications may be needed in response to monitoring results. Any site modifications will be developed in consultation with appropriate regulatory agencies. During subsequent years, the mitigation area will be monitored annually.

Five monitoring reports documenting the status of the mitigation area will be submitted to Ecology. The first report will be the *As-Built Design*, followed by reports documenting activities through years 3, 5, 8, and 10. The reports will include information such as site maps; plant composition and density; a tree and shrub cover assessment; a survey of tree and shrub density, size, height, and survival; and indicators of hydrologic connection. Fauna also will be monitored visually to document site use by amphibian, fish, bird, and resident mammal populations. Transect lines will be marked permanently in the field and noted on maps developed for the mitigation area. Photographs from fixed points will be used to document monitoring successes.

5.2 Contingency Plan

If mitigation is not successful, the Navy will develop and implement a contingency plan after an investigation has taken place to determine any causes of failure. The contingency plan would provide an analysis if the performance standards are not met by Year 5. The plan would include possible steps necessary to correct any failure. Possible contingency measures could include but are not limited to replanting, control of invasive species, herbivore control, and access control. Along with these possible steps necessary to correct any failure, this contingency plan would outline a timeframe for implementing any corrective actions.

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6.0 DESIGN AND CONSTRUCTION COSTS

The design and construction costs will be submitted with the final mitigation plan (see Chapter 3 for proposed implementation and schedule).

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7.0 CONCLUSIONS

The Navy is currently preparing a SEIS to evaluate changes to the home basing alternatives and analysis contained in the *Final Environmental Impact Statement (EIS) for Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet*, published in 2008. The SEIS will assess the potential environmental effects of home basing P-8A aircraft and the related changes in aircraft operations and personnel, facility modifications, and construction requirements at both NAS Whidbey Island and NAS Jacksonville, Florida. Implementation of the P-8A home basing would require new construction of associated infrastructure and support facilities.

The purpose of this conceptual mitigation plan is to discuss mitigation options for the proposed impact to wetlands WD-3 and WS-1 at NAS Whidbey Island (Ault Field). A jurisdictional delineation was performed by ecologists from E & E on February 1, 2013. WD-3, a wetland totaling 4.54 acres, was identified, delineated, and then rated in accordance with the Washington State Wetland Rating System for Western Washington. This wetland was rated as a Depressional Category III wetland. The USACE also identified approximately 0.8 acre of wetland, WS-1, within a stormwater drainage ditch that runs parallel to the existing impervious surface. Wetland WS-1 is hydrologically connected to WD-3 and is considered part of the Depressional Category III wetland.

The proposed development of infrastructure and support facilities at NAS Whidbey Island (Ault Field) under Alternative 1 would permanently impact approximately 0.8 acre of Wetland WS-1. Under Alternative 2, the proposed parking apron expansion would permanently impact approximately 2.44 acres of wetland, including 0.8 acre of WS-1 and 1.64 acres of WD-3. A new 1,550-linear-foot ditch would be created around the apron under Alternative 1, and approximately 1,600 linear feet of ditch would be created under Alternative 2.

To mitigate wetland impacts to wetlands WD-3 and WS-1, two alternative sites are proposed at the Crescent Harbor mitigation area at NAS Whidbey Island's Seaplane Base. These potential sites were selected by the Navy because each has a sustainable source of natural water; the Navy owns the land; each is close to either other wetlands or undisturbed areas; and/or each connects to relatively undisturbed habitats. Each mitigation site also has adjacent upland or other habitats that can provide a buffer of sufficient width to protect the target wetland.

Per the guidelines identified in *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Ecology et al. 2006), the Navy proposes to mitigate the wetland impacts at either a ratio of 4:1 for wetland rehabilitation or at 8:1 for wetland enhancement at the Crescent Harbor mitigation area. This would result in rehabilitation of 3.2 acres of wetlands under Alternative 1 or 6.5 acres under Alternative 2, or enhancement of 6.5 acres of wetland under Alternative 1 or 13 acres under Alternative 2.

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Appendix A

Site Selection Checklist for the Crescent Harbor Mitigation Site

Mit. Area A (Crescent Harbor)

Appendix J - Site Selection Checklist

The checklist below can be used to help you determine if a potential site is appropriate for compensatory mitigation. The more "yes" answers to the following questions the greater the likelihood that the site is appropriate for compensatory mitigation and will be sustainable over time. "No" answers, while not sufficient to remove a site from consideration, are "red flags" of potential constraints or problems which should be recognized and considered. When going through the list of questions consider whether or not the site possesses the physical, chemical, and biological characteristics to support the proposed goals and objectives for wetland compensatory mitigation. See Section 3.3, *Selecting a Site*, for further discussion of considerations for site selection. In addition, the site selected should meet all of the regulatory requirements for compensatory mitigation, such as where it should be located (see Part 1, particularly Chapter 6, including the section on choosing a location).

Yes	No	Source of Water
☑	☐	Does the proposed mitigation site have a natural source of water (e.g., overbank flooding, precipitation, ground water) sufficient to support a wetland and the target functions for the mitigation project?
☑	☐	Will the source of water be sustainable and relatively predictable over the long term (i.e., without long-term irrigation and engineered solutions such as tide gates, diversions, and pumping requiring long-term maintenance)?
N/A ☐	☐	If applicable, will you be able to obtain the appropriate water rights?
☐	☑	Does the site contain previous wetland areas that can be restored (re-established or rehabilitated)?
☐	☑	Does the site have the necessary physical and soil features to maintain the desired hydroperiod? (e.g., Will the types of soil on the site be able to support the proposed water regime of the wetlands? For example, sandy soils may not retain water long enough.)
Yes	**No**	**Soils**
☐	☑	Does the soil have hydric indicators and/or is the site within an area of listed/mapped hydric soils?
☐	☑	Does the soil have levels of organic matter and nutrients (from a soil analysis) that will support the targeted vegetation and functions? Soil characteristics can often influence vegetative success and ultimately a project's success.
☑	☐	Is the soil free of contamination (e.g., heavy metals, toxic organics, salts, acids)?

☐	☑	Is the soil structure intact and not significantly altered by previous land-use activities (e.g., grading, farming/tilling)? Previous land-use activities can result in soil compaction and create an impermeable soil layer, preventing infiltration of surface waters which support root growth and plant establishment.
Yes	**No**	**Landscape Position**
☑	☐	Will the proposed wetland have a hydrogeomorphic (HGM) classification appropriate for its position in the landscape regardless of whether it is the same HGM class as the wetland that was impacted? (e.g., a potential wetland in a riverine setting should be a riverine flow through or riverine depressional wetland and not a slope or depressional wetland <u>not</u> supported by overbank flooding)
☑	☐	Has the position of the site, in relation to other wetlands, habitats, and processes occurring in the landscape, been considered? (Refer to Habitat Connectivity below.)
☑	☐	Can the site address management problems identified within the basin (e.g., flooding, sedimentation, water quality, etc.)?
☑	☐	Have the restoration/protection goals for the larger watershed (e.g., 2514 watershed plans) been considered (if they have been developed) in determining the location and type of mitigation?
☑	☐	If the hydroperiod of the site has been significantly altered, does the project provide for measures that restore it to the proper HGM class? (e.g., remove levees for wetlands in the floodplain)
Yes	**No**	**Land Use**
☑	☐	Is the wetland mitigation proposed for the site consistent with provisions of existing land-use plans, zoning and other documents?
☑	☐	Is the site free from past land-use practices that may affect compensatory mitigation success? (e.g., Has there been filling, dumping of toxics, or permanent alteration of natural water flow processes through forest clearing, ditching, or paving activities in the watershed?)
☑	☐	Are the proposed mitigation goals and objectives compatible with the surrounding land uses of the proposed site? (e.g., Will increased hydrology negatively affect adjacent farming operations?)
☑	☐	Does the location of the site allow it to be protected from direct, indirect and cumulative impacts from current and potential future land use? (i.e., Do existing conditions in the potential contributing basin for the site appear to support planned wetland processes and functions?)

Yes	No	Habitat Connectivity
☑	☐	Is the site in close proximity to other wetlands, undisturbed areas or aquatic sites, and/or are the connections to those habitats relatively undisturbed? This is particularly important if the main goal of the mitigation project is to provide wildlife habitat for certain species.
Yes	**No**	**Buffers**
☑	☐	Does the site have adjacent upland or other habitats that can provide, or be developed to provide, a buffer of sufficient width to protect the target wetland functions for the long term (i.e., in other words future land uses have been considered)?
Yes	**No**	**Invasive Species**
☑	☐	Are the site and adjacent areas relatively free of invasive species?
Yes	**No**	**Seed Banks**
☐	☑	Is the site likely to have an existing native seed bank?
Yes	**No**	**Endangered Species**
☐	☑	Are there any ESA-listed species present on the site? The presence of ESA-listed species (i.e., the answer to this question is "Yes") may make the site a priority for site protection (i.e., compensatory mitigation may be appropriate) or compensatory mitigation activities could be limited.
Yes	**No**	**Other Factors**
☑	☐	Long term-maintenance – Can the goals and objectives of the mitigation site be achieved, without continual long-term maintenance?
☑	☐	Site ownership - Is the site free of ownership or legal constraints that would prevent its long-term protection?
☑	☐	Legal mechanisms for protection – Is it possible to obtain a conservation easement from the owner of the property? Conservation easements will help ensure that the site will be protected for the long term.
☑	☐	Cultural resources – Is it likely that the site is free of cultural resources? The site is not listed on the National Register of Historic Places or the project has not raised concerns with the local Native American Tribes with knowledge of the area.
☑	☐	Location near an airport – Has the Federal Aviation Administration guidance on locating certain land uses been considered? Sites affected by FAA guidance and rules may result in design constraints.
☑	☐	Cost- Have the potential costs of the site been considered? The cost of land acquisition, activities such as earthwork and disposal of excavated materials can be high and should be considered in site selection.

Appendix B

Soil Types Located at the Project and Mitigation Sites

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Sholander, cool-Spieden complex, 0 to 5 percent slopes, occupies valleys, with a parent material made up of glacial outwash over dense glaciomarine deposits. This soil is somewhat poorly drained to poorly drained, with a seasonally high water table of between 4 and 12 inches (minimum depth), although it does have a moderately high to very high capacity to drain water. The natural vegetation consists of scrub-shrub and evergreen trees.

Coupeville loam, with slopes ranging from 0 to 3 percent, occurs on nearly level to gently undulating terrain. This soil is moderately well drained but, because of its fine-textured substratum, has slow internal drainage. The surface layer, to a depth of about 10 inches, is black, granular, friable loam. The next layer, 10 to 18 inches in depth, is a dark grayish-brown sandy loam or light sandy clay loam. The third layer, at a depth of 18 inches, is olive gray or gray sandy loam, faintly mottled with yellow and brown. There is an abrupt boundary between this layer and an underlying layer of gray, very plastic clay. The surface soil has a high organic-matter content and has medium acidity that becomes less acidic with increasing depth.

Coveland loam, with slopes ranging from 0 to 5 percent, occupies slight depressions in uplands or terraces next to bays and inlets. The surface layer, to depths of 8 to 15 inches, is black, friable, moderate medium granular loam. The next layer, to a depth of 24 inches, is light olive-gray or light brownish-gray, strongly mottled, massive, firm loam or heavy sandy loam. At 24 inches deep, the soil is olive or olive-gray clay, very strongly mottled with brownish-yellow and yellow. The material is very plastic when wet and hard when dry. This soil type has a high organic-matter content, in which the surface layer is moderately acidic.

Semiahmoo muck, with slopes ranging from 0 to 2 percent, occupies depressions on glacial outwash plains and broad flood plain. This soil consists of very deep, very poorly drained soils formed in herbaceous organic deposits. The surface layer, to a depth of 6 inches, is black to dark gray color, with a moderate fine granular structure that contains many very fine roots. The next layer, between 6 and 12 inches, is a black muck with a strong medium subangular blocky structure. The underlying layer, below 12 inches, is a dark, reddish-brown muck with a very thin platy structure.

Soil Map—Island County, Washington
(Soils Survey Map of Impact Area (Ault Field))

Map Scale: 1:2,920 if printed on A size (8.5" x 11") sheet.

N

Meters: 0, 40, 80, 160, 240

Feet: 0, 150, 300, 600, 900

MAP LEGEND

Area of Interest (AOI)
Area of Interest (AOI)

Soils
Soil Map Units

Special Point Features
Blowout
Borrow Pit
Clay Spot
Closed Depression
Gravel Pit
Gravelly Spot
Landfill
Lava Flow
Marsh or swamp
Mine or Quarry
Miscellaneous Water
Perennial Water
Rock Outcrop
Saline Spot
Sandy Spot
Severely Eroded Spot
Sinkhole
Slide or Slip
Sodic Spot
Spoil Area
Stony Spot
Very Stony Spot
Wet Spot
Other

Special Line Features
Gully
Short Steep Slope
Other

Political Features
Cities

Water Features
Streams and Canals

Transportation
Rails
Interstate Highways
US Routes
Major Roads
Local Roads

MAP INFORMATION

Map Scale: 1:2,920 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island County, Washington
Survey Area Data: Version 10, Jun 28, 2012

Date(s) aerial images were photographed: 7/21/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Island County, Washington (WA029)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1021	Sholander, cool-Spieden complex, 0 to 5 percent slopes	11.9	77.1%
1055	Urban Land-Coupeville-Coveland, cool, complex, 0 to 5 percent slopes	3.5	22.9%
Totals for Area of Interest		**15.4**	**100.0%**

Map Scale: 1:5,070 if printed on A size (8.5" x 11") sheet.

N

Meters: 0 | 50 | 100 | 200 | 300

Feet: 0 | 250 | 500 | 1,000 | 1,500

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

- Gully
- Short Steep Slope
- Other

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:5,070 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000.

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Map Unit Legend

Island County, Washington (WA029)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1006	Semiahmoo muck, 0 to 2 percent slopes	4.7	4.5%
1021	Sholander, cool-Spieden complex, 0 to 5 percent slopes	51.9	48.9%
1022	Coveland loam, cool, 0 to 5 percent slopes	0.5	0.4%
1023	Coupeville loam, 0 to 3 percent slopes	22.7	21.4%
2023	Sucia-Sholander complex, cool, 2 to 15 percent slopes	25.1	23.6%
3011	Everett-Alderwood complex, 0 to 5 percent slopes	1.3	1.2%
Totals for Area of Interest		**106.1**	**100.0%**

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